

# Installation and Operation Guide

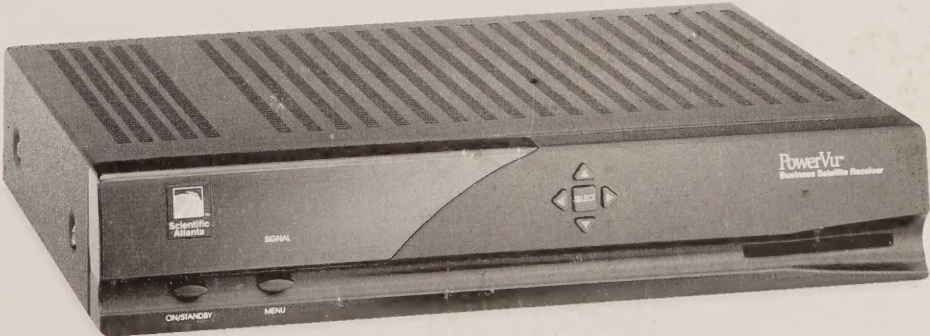



## PowerVu® Model D9234 Business Satellite Receiver

FA 4.17400  
5150  
2/3

SYM 3.6800

0062 - GWN  
0065 - " ?  
0062 - " ?  
162 - RWD





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# Quick Setup Guide

If BSR setup details are unavailable, you can perform a Quick Setup of your Business Satellite Receiver by following the step-by-step instructions in this Quick Setup Guide. After performing the Quick Setup, you can change the current settings to better suit your BSR operating requirements. If you are unsure about which receiver settings to use, contact your dealer/reseller or local service provider for assistance. For complete receiver setup information, see "Receiver Setup menu" in the Model D9234 Business Satellite Receiver Installation and Operation Guide.



**IMPORTANT:** Only preauthorized subscriber services can be made available for your Business Satellite Receiver. If a unauthorized signal is present, a warning message displays on the TV monitor. If this happens, contact your dealer/reseller or local service provider about satellite broadcast services authorization.

## ...About the Video Standard

The Video Standard used to operate the receiver is preset at the factory to either NTSC (525-line), or PAL (625-line). Changing the Video Standard is normally required only for operating the receiver in a network or jurisdiction that uses the alternate Video Standard, and/or when new (or different) subscriber services are made available. Changing the Video Standard or resetting the receiver to the default factory settings may cause the TV video to display improperly. If the current Video Standard setting is incompatible with subscriber/network services, it must be changed (see also "...About changing the Video Standard" in the Installation and Operation Guide).

## Receiver Startup

### Step 1. Check your installation (see Figure A):

- Check that your receiver is correctly installed and connected to the satellite LNB antenna, to other A/V equipment (as required) and to AC power.
- Verify that the satellite LNB power switch at the receiver rear panel is correctly set (OFF to use the external LNB power source, or ON to use the internal receiver LNB power source).

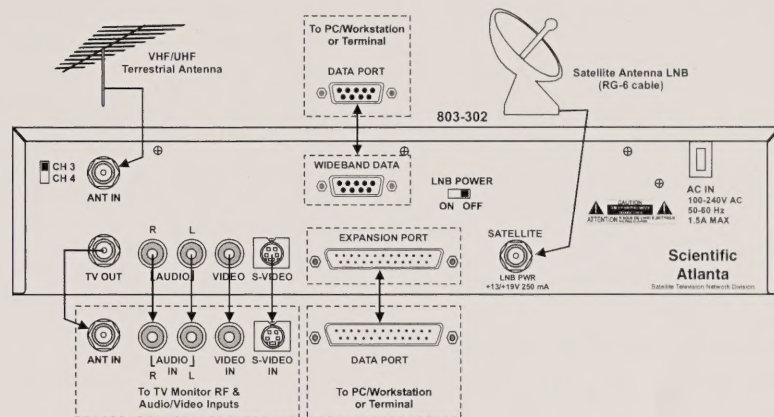


Figure A. TV & RF plus optional connections (NTSC model with Wideband Data option shown)

- Step 2. Power-on the receiver:** Press the POWER button on your Remote Control (1) or press the ON/STANDBY button at the receiver front panel (2).
- Step 3. Change the Video Standard, if required (receiver front panel only):**
  - Press and hold the SELECT button, then...
  - Press the  $\uparrow$  arrow button (4) twice to replace the current setting.
  - Press the  $\uparrow$  arrow button twice again (4) to select the alternate Video Standard.

To use the POWER, ON/STANDBY, SELECT and arrow buttons...

- Press POWER ..... POWER
- Press ON/STANDBY ..... ON/STANDBY
- Press SELECT ..... SELECT
- Press  $\uparrow$  and  $\downarrow$  .....  $\uparrow$   $\downarrow$
- Press  $\leftarrow$  and  $\rightarrow$  .....  $\leftarrow$   $\rightarrow$



## Quick Setup instructions

Follow these quick setup instructions to find a signal using the BSR built-in signal search function.

**Step 1.** Display the **BSR MAIN MENU** by pressing MENU.

**Step 2.** Display the **RECEIVER STATUS** menu by pressing 2 and then SELECT, or move to Receiver Status and press SELECT.

**Step 3.** Display the **RECEIVER SETUP** menu by pressing 3 and then SELECT, or move to Receiver Setup and press SELECT.

**Step 4.** Enter the **Local Oscillator #1 Frequency** (in GHz) based on C or Ku-Band LNB/F operation and press SELECT (e.g., 10750 for Ku-Band, and 5150 for C-Band).

**Step 5.** Enter the **Symbol Rate** (in MS/s) and press SELECT.

**Step 6.** Display the correct **FEC Rate** and press SELECT.

**Step 7.** Activate the signal search to "**Find**" the signal by moving to Find and pressing SELECT (set to ON).  
The "Lock, Sig" Signal State is displayed when a signal is found.

**Step 8.** Save the settings: (after signal found)

(a) Move to Exit and press SELECT (or press 1 and then SELECT) to display the Save pop-up menu.

(b) Press 1 to save the new configuration (YES).

When the signal is found, the Find option is automatically set to OFF. You can also terminate the search manually by setting the Find option to OFF. Repeat this action to search for another signal. If no Remote Control is available, you can perform the these functions using the following front panel buttons.

- ☐ **Save:** Press and hold down both the ← and → arrow buttons simultaneously (5) to save the new configuration (YES)
- ☐ **Discard:** Press and hold down both the ↑ and ↓ arrow buttons simultaneously (4) to discard all changes (NO)
- ☐ **Cancel:** Press SELECT (3) to cancel the operation (CANCEL)



**WARNING!** Saved settings are automatically restored when the receiver is restarted after AC power is switched off or interrupted. Upon restarting, the receiver defaults to the last virtual channel displayed for more than 20 seconds after exiting from menus (see also "...About saving changes" in the Installation and Operation Guide).

## ...About factory default settings

Factory default settings can be modified at any time. A Factory Reset option is also available for replacing the current settings with the factory defaults (see Table A).

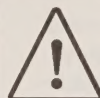
Table A. Factory default settings

	Option	Menu	Default setting
1.	Frequency Mode	Receiver Setup	L-Band/1
2.	Frequency	Receiver Setup	950 MHz
3.	Local Oscillator #1	Receiver Setup	9.750 GHz
4.	Local Oscillator #2	Receiver Setup	10.600 GHz
5.	Crossover	Receiver Setup	11.700 GHz
6.	Polarization	Receiver Setup	H (Horizontal)
7.	FEC Rate	Receiver Setup	7/8
8.	Symbol Rate	Receiver Setup	28.3465 MSymbols/s
9.	Network ID	Receiver Setup	1
10.	Lock Level	User Setup	0
11.	Bouquet ID	User Setup	0
12.	TV Audio	User Setup	Left + Right
13.	Baud Rate	User Setup	9600
14.	Aspect Ratio	User Setup	Normal
15.	Local Time	User Setup	12:00 AM
16.	IR Remote	User Setup	Enabled
17.	Date Format	User Setup	US
18.	Video Standard	User Setup	AUTO
19.	Subtitles Language	User Setup	OFF
20.	Password	User Setup	1234
21.	Search Mode	Search Setup	OFF
22.	Search Type	Search Setup	Frequency
23.	Lower Range	Search Setup	950 MHz
24.	Upper Range	Search Setup	2150 MHz
25.	IQ Select	Search Setup	Automatic
26.	UHF Channel Setting		38

This symbol alerts you to the presence of uninsulated dangerous voltage inside the product enclosure that poses a risk of electric shock.



**CAUTION**  
**RISK OF ELECTRICAL SHOCK**  
**DO NOT OPEN**



This symbol alerts you to important operating and maintenance (servicing) instructions included with this product.

### CAUTION

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVERS FROM THIS UNIT. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL. SEE ADDITIONAL SAFETY INSTRUCTIONS BELOW.

### WARNING

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

### CAUTION

TO PREVENT ELECTRICAL SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERTED.

POUR EVITER LES CHOCS ELECTRIQUES, INTRODUIRE LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

## IMPORTANT SAFEGUARDS

**Read Instructions:** All the safety and operating instructions should be read before this product is operated.

1. **Retain Instructions:** The safety and operating instructions should be retained for future reference.
2. **Heed Warnings:** All warnings on the product and in the operating instructions should be adhered to.
3. **Follow Instructions:** All operating and use instructions should be followed.
4. **Cleaning:** Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. **Attachments:** Do not use attachments not recommended by Scientific-Atlanta as they may cause hazards.

6. **Water and Moisture:** Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.
7. **Accessories:** Do not place this product on an unstable cart, stand, bracket, or table. The product may fall causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, bracket, or table recommended by Scientific-Atlanta. Any mounting of the product should follow the instructions, and should use a mounting accessory recommended by Scientific-Atlanta.  
An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

PORTABLE CART WARNING





8. **Ventilation:** Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product, and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the instructions have been adhered to.
9. **Heat:** This product should be located away from heat sources such as radiators, heat registers, stoves or other products (including amplifiers) that radiate heat.
10. **Power Sources:** This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply in your home or business, consult your appliance dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions supplied with the product. For applications other than in North America, a suitable attachment plug adapter should be used for connection to the power source. For determining the appropriate attachment adapter type, refer to qualified technical personnel.
11. **Polarization:** This product may be equipped with a polarized alternating current line plug (i.e., a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
12. **Power Cord Protection:** Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. **Lightning:** For added protection for this product during a lightning storm or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
14. **Power Lines:** An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
15. **Overloading:** Do not overload wall outlets, extension cords or integral convenience receptacles, as this can result in a risk of fire or electric shock.
16. **Object and Liquid Entry:** Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
17. **Servicing:** Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
18. **Damage Requiring Service:** Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - (a) When the power-supply cord or plug is damaged.
  - (b) If liquid has been spilled, or objects have fallen into the product.
  - (c) If the product has been exposed to rain or water.
  - (d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
  - (e) If the product has been dropped or damaged in any way.
  - (f) The product exhibits a distinct change in performance.
19. **Replacement Parts:** When replacement parts are required, be sure the service technician uses replacement parts specified by Scientific-Atlanta, or parts having the same operating characteristics as the original parts. Unauthorized part substitutions made may result in fire, electric shock or other hazards.
20. **Safety Check:** Upon completion of any service or repairs made to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.
21. **Outdoor Antenna Grounding:** If an outside antenna or cable system is connected to this product, ensure that the antenna or cable system is properly grounded to provide protection against voltage surges and built-up static charges. Appropriate sections of the National Electrical Code (NFPA 1990) provide information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode (see "...About receiver & satellite antenna grounding").

## ...About receiver & satellite antenna grounding

Before you can operate your Business Satellite Receiver system, both the receiver chassis and the satellite antenna LNB connection(s) must be properly grounded. Information about grounding your receiver and satellite antenna follow.

### Grounding the receiver

The receiver ground connection is made from the shield<sup>1</sup> conductor attached to the RF coaxial cable "F" connector (rear panel RF IN input) to an external grounding rod via a receiver/antenna grounding block. A separate grounding wire connects the grounding block (and the satellite antenna LNB grounding block) to the grounding rod (see Figure 1).

### Grounding the LNB and/or VHF/UHF antenna

The antenna ground connection is made from the satellite LNB/antenna ground and/or the VHF/UHF terrestrial antenna discharge unit to an external grounding rod via a receiver/antenna grounding block.

### General grounding information

The actual ground/cable connections made depend on your site installation requirements, and on the type of satellite antenna and/or VHF/UHF terrestrial antenna you have. If your satellite antenna installation includes a dual-port LNB, both RF coaxial cables must be routed to the grounding block. When connecting RF coaxial antenna cables to the grounding block, looping the antenna cables as shown in the accompanying figure helps to direct moisture away from the grounding block. Always choose the shortest route possible when connecting RF coaxial cables to the receiver/antenna grounding block, and when connecting the grounding wire(s) to the grounding rod.

<sup>1</sup> Multi-strand (braided) shield that surrounds the center conductor of the coaxial cable

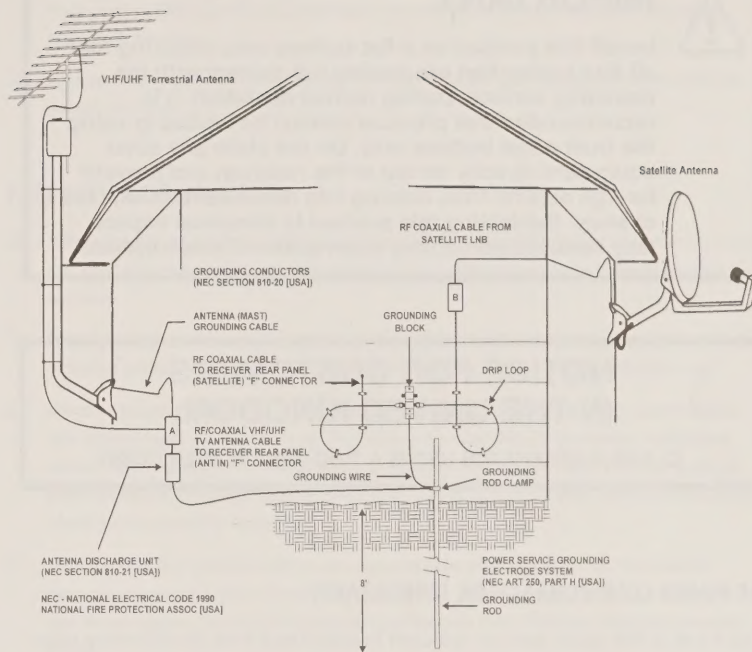


Figure1. Receiver & satellite antenna grounding

Ensure that all wires/cables are properly routed, and are clamped/secured, as required. Install the grounding rod as close to the grounding block as possible (NEC 820-40 [USA]). If your satellite antenna is installed on a separate support structure and/or is not located near the RF antenna cable point-of-entry, a duplicate ground using a second grounding rod installed as close to the antenna as possible is recommended. Typically, a good earth ground can be obtained by driving a grounding rod made of copper-clad iron into the ground next to the grounding block.





## IMPORTANT

Install this product on a flat surface only, ensuring that all four rubber feet are making full contact with the mounting surface. During normal operation, it is recommended that physical contact be limited to using the front panel buttons only. Do not place any other equipment directly on top of the receiver, and prevent foreign objects from coming into direct contact with the chassis. Subjecting this product to abnormal impact may result in momentary interruption of video service.

## NOTICE FOR CUSTOMERS IN THE UNITED KINGDOM

CLASS II APPARATUS USING A TWO-WIRE POWER CORD

### AC MAINS LEAD CONNECTION (IMPORTANT)

The wires in this mains lead are coloured in accordance with the following code:

- ☐ Blue: Neutral
- ☐ Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with coloured markings identifying the terminal in your apparatus, proceed as follows:

1. The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
2. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.



**WARNING:** Do not connect the blue or brown wires to the earth terminal of a three-pin plug. **Note:** The earth terminal is distinguished by its color (green, or green-yellow), or by being marked with the letter E, or marked with the safety earth symbol (⏚).

## SAFETY PRECAUTIONS (EU Market)

## MESURES DE SÉCURITÉ

## SICHERHEITSMASSNAHMEN

## PRECAUCIONES DE SEGURIDAD

### WARNING

To prevent fire or electric shock:

- ☐ Do not expose this apparatus to rain or moisture.
- ☐ Avoid spilling liquids on or near this apparatus.
- ☐ Do not open the top cover of this apparatus.
- ☐ Do not push objects through openings in this apparatus.
- ☐ Refer servicing to qualified personnel only. Contact your cable operator for service.

### ATTENTION

Afin d'éviter tout incendie ou choc électrique:

- ☐ Ne laissez pas cet appareil sous la pluie ou dans un endroit humide.
- ☐ Ne renversez pas de liquide sur ou à proximité de l'appareil.
- ☐ N'ouvrez pas le couvercle supérieur de l'appareil.
- ☐ N'insérez pas d'objet dans les ouvertures de l'appareil.
- ☐ Faites réparer votre appareil par une personne qualifiée, contactez votre opérateur cable pour le service



## WARNUNG

Um Feuer oder elektrischen Schock zu vermeiden:

- ❑ Keiner Nässe oder Feuchtigkeit aussetzen.
- ❑ Keine Flüssigkeiten auf oder in der Nähe des Gerätes verschütten.
- ❑ Den oberen Deckel nicht öffnen.
- ❑ Keine Gegenstände in die Geräteöffnungen stecken.
- ❑ Arbeiten am Gerät nur von qualifiziertem Personal vornehmen lassen. Wenden sie sich an ihre Kabelfirma.

## ADVERTENCIA

Para prevenir incendio o una descarga eléctrica:

- ❑ No exponga este aparato a la lluvia o a la humedad.
- ❑ Evite derramar líquidos en o cerca del aparato.
- ❑ No abra la cubierta superior de este aparato.
- ❑ No introduzca objetos a través de las aberturas de este aparato.
- ❑ Mandelo a servicio únicamente donde existe personal calificado. Para servicio consulte con su operador de cable.

## CAUTION

- ❑ To protect this apparatus against damage from lightning storms and power-line surges, or when you are not using this apparatus for a long period of time, disconnect the power cord from the AC outlet.
- ❑ To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself. Additionally, never walk on, place objects on, or pinch the power cord.
- ❑ The top cover on this apparatus has openings for ventilation to protect it from overheating. To ensure reliable operation, do not block or cover these openings by placing this apparatus on a bed, sofa, rug, or any similar surface, or by placing entertainment apparatus, lamps, books, or other objects on the top cover.

- ❑ Additionally, never place this apparatus near or over a radiator or heat register, or a built-in installation, such as a bookcase or rack, unless the installation provides proper ventilation.
- ❑ Locate this apparatus on a stable, vibration-free surface capable of supporting its weight and size.

## PRÉCAUTIONS À PRENDRE

- ❑ Afin de protéger votre appareil des orages et des surtensions de courant ou si vous ne l'utilisez pas pendant une période prolongée, débranchez de la prise électrique du secteur.
- ❑ Pour débrancher, tirez sur la prise. Ne tirez jamais sur le cordon secteur. En outre, ne marchez jamais sur le cordon, ne placez pas d'objet dessus et ne le coincez pas.
- ❑ Le couvercle supérieur de cet appareil comprend des ouvertures pour la ventilation afin d'éviter qu'il ne chauffe trop. Pour assurer un bon fonctionnement, ne bloquez pas ou ne couvrez pas ces ouvertures en plaçant cet appareil sur un lit, un sofa, un tapis ou toute autre surface semblable. Ne posez pas de lampes, livres ou tout autre objet sur le couvercle supérieur.
- ❑ De plus, il ne faut jamais mettre cet appareil près d'un radiateur ou tout autre élément dégageant de la chaleur. Ne l'incorporez pas dans une installation comme une bibliothèque, une étagère, à moins que l'installation offre une ventilation appropriée.
- ❑ Installez cet appareil sur une surface dégagée, stable et sans vibration capable de supporter son poids et sa taille.

## VORSICHT

- ❑ Um dieses Gerät vor Blitzschlag bzw. Stromüberladung zu schützen, oder wenn das Gerät längere Zeit nicht benutzt wird, soll der Stecker aus der Steckdose gezogen werden.
- ❑ Zum Abschalten immer am Stecker selbst und nie am Kabel ziehen. Außerdem nie darauf treten, einen Gegenstand darauf legen oder das Kabel drücken.
- ❑ Die Oberseite des Gerätes hat Ventilationsöffnungen, die das Gerät vor Überhitzung schützen. Um einwandfreies Funktionieren zu gewährleisten, dürfen diese Öffnungen nicht blockiert oder verdeckt werden (z.B. nicht auf ein Bett, Sofa, Teppich oder ähnliche Unterlagen stellen, oder Lampen, Bücher oder ähnliches auf das Gerät stellen).

- ❑ Außerdem soll dieses Gerät nie in der Nähe einer Heizquelle stehen. Vermeiden Sie, das Gerät in einem geschlossenen Platz aufzustellen, z. B. Schrank, wo ausreichende Ventilation nicht möglich ist.
- ❑ Stellen Sie das Gerät auf eine stabile und schwingungsfreie Unterlage, die für das Gerät groß genug ist.

## PRECAUCION

- ❑ Para proteger este aparato contra daños producidos por tormentas eléctricas y pulsaciones de energía eléctrica, o cuando no use este aparato por largo tiempo, desconéctelo del tomacorriente de CA.
- ❑ Para desconectar el cable, tómelo del enchufe y desconéctelo. Nunca tire del cable directamente. Asimismo, nunca apriete, pise, o coloque objetos sobre el cable.
- ❑ La cubierta superior de este aparato tiene aberturas de ventilación para evitar que se recaliente. Para asegurar una operación confiable, no bloquee o cubra estas aberturas colocando este aparato sobre una cama, sofá, alfombra o cualquier superficie similar, o colocando sobre la cubierta superior artefactos de entretenimiento, lámparas, libros u otros objetos.
- ❑ Adicionalmente, nunca coloque este aparato cerca o sobre una salida de calefacción o lo instale en un lugar tal como un mueble integrado o estante para libros, a menos que la instalación proporcione una ventilación adecuada.
- ❑ Coloque este aparato sobre una superficie estable, sin vibraciones y que tenga la capacidad de aguantar su peso y tamaño.



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# Introduction

## ...About this guide

This Installation and Operation Guide includes all the information you'll need to install and begin using your new Scientific-Atlanta PowerVu Business Satellite Receiver. Use it to familiarize yourself with product features and operation, and for quick reference when needed. The guide provides complete operating instructions and other important information about your Business Satellite Receiver. We recommend that you read this guide before you begin using the receiver.

## Your Business Satellite Receiver

Welcome to the world of PowerVu direct-broadcast satellite business and entertainment services. With your new Business Satellite Receiver you can experience the ultimate in digital-quality video, audio and other satellite broadcast services. In addition to regular television, CCTV or CATV broadcasts, you can now receive hundreds of additional channels of satellite programming. Designed using state-of-the-art electronics and broadcast satellite technology, your PowerVu Model D9234 Business Satellite Receiver is quality-built for trouble-free operation, and comes equipped with many built-in features and capabilities. Your Business Satellite Receiver may be equipped differently for some countries or jurisdictions.

- ☐ MPEG 2/DVB digital video and audio.
- ☐ Up to 500 channels (depending on availability)
- ☐ Variable symbol rate  
(Single Channel Per Carrier & Multiple Channel Per Carrier operation)
- ☐ Graphical user interface and on-screen display
- ☐ WST and NABTS closed-captioning
- ☐ Front panel or Remote Control operation
- ☐ Stereo audio and S-Video output
- ☐ LS (Low Speed) data capability
- ☐ LNB power ON/OFF switch
- ☐ System Lock Level security and Password-protection
- ☐ 24-independent user-configurable Network Presets

# Setup and installation

This section provides information about setting up and installing your new Business Satellite Receiver, or for modifying your current equipment installation.

## Unpacking your receiver

Before you proceed with unpacking the equipment, inspect the shipping carton for damage. If damage is apparent, do not proceed with unpacking and report the damage immediately to the shipper or your retailer. If there is no apparent damage, remove the contents from the carton and protective packaging. Retain the packaging in the event of return, or for equipment storage.

After unpacking your Business Satellite Receiver, check that you have also received the following accessories:

- ☐ One IR (Infra-Red) Remote Control transmitter
- ☐ Two size AA batteries

## Installing the Remote Control batteries

Before you can use the Remote Control transmitter to operate your Business Satellite Receiver, the two size AA batteries must first be installed. The batteries can supply power for up to several months, depending on how often the Remote Control is used. If the Remote Control does not appear to be operating properly, the batteries may require replacement. When replacing the batteries, it is important to use only those of the same type and rating. Always dispose of exhausted batteries in a safe manner. If the Remote Control is not being used for an extended period of time, it is recommended that the batteries be removed. For more information about your Remote Control transmitter, see "Remote Control functions".

Your Business Satellite Receiver comes equipped with a Remote Control transmitter. An optional AllTouch Remote Control transmitter is available which can be programmed to operate your TV, Scientific-Atlanta Home Communications Terminal or cable box. For Remote Control battery removal and replacement, see the following instructions.

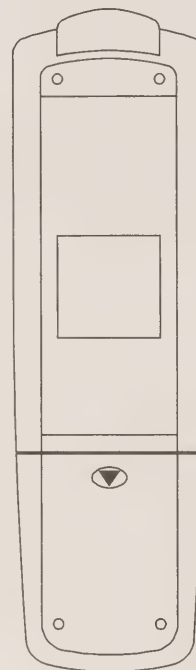


Figure 2. Remote Control transmitter case (rear) showing battery compartment

### To install batteries in the Remote Control transmitter...

1. Remove the battery compartment cover from the Remote Control case (rear) by sliding the tab away from the case in the direction of the arrow (see Figure 2).
2. Remove the old batteries from the battery compartment.
3. Noting the polarity, install new batteries of the same size, type and rating into the battery compartment and replace the cover.
4. Check the operation of the Remote Control with the new batteries.



# Connecting your system

The following information is provided to help you set up and connect your Business Satellite Receiver to the satellite antenna, cable services, TV monitor, A/V (Audio/Video) and other equipment.

To maximize system performance and to take advantage of your TV monitor and A/V capabilities, use stereo A/V audio and S-Video cable connections wherever possible. S-Video connections provide significantly better quality video output in comparison with standard RCA (phono) type or RF (coaxial) type connections. If the system components you are connecting to the BSR do not include S-Video (or SCART) connectors, use A/V connections instead of RF. Note that certain connections may not be required or may be used in place of others, depending on how you intend to connect your receiver. Figure 3 shows available receiver rear panel connections for both NTSC and PAL models. For equipment interconnection details, see "TV & RF plus optional connections".



**IMPORTANT:** EMI (Electro-Magnetic Interference) limits set for this product require installation of an external ferrite core EMI suppression device (use only Steward P/N 28A2025-OAO) onto the S-Video cable if connected between the receiver and customer video equipment. For proper operation, the EMI suppressor must be fastened onto the cable as close to the rear panel S-VIDEO connector as possible. Failure to do so may result in radio or TV interference, in which case it is the responsibility of the user to correct such interference at the user's expense. The S-Video cable should be of braided shield construction with metal end shells.

The above component can be obtained directly from the manufacturer (Steward, Inc.), or from Scientific-Atlanta using the information listed below.

Steward, Inc.  
East 36th Street, P. O. Box 510,  
Chattanooga, TN 37401 USA  
Tel: 1-615-867-4100/Fax: 1-615-867-4102  
Order: P/N 28A2025-OAO

Scientific-Atlanta Canada, Inc.  
120 Middlefield Road,  
Scarborough, ON M1S 4M6 Canada  
Tel: 1-416-299-6888/Fax: 1-416-299-7145  
Order: P/N 601-175

If you have any questions concerning this PowerVu product, contact your local Scientific-Atlanta customer support center. Customer Support Center locations and telephone/contact numbers are listed on the back pages of the product manual.

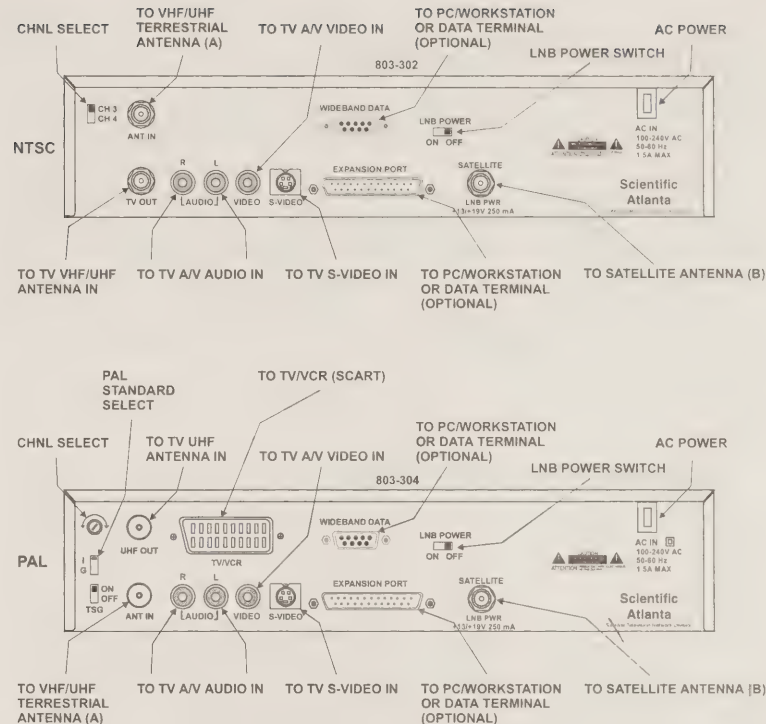


Figure 3. Rear panel connections

## ...About satellite and regular TV programming

The rear panel of your Business Satellite Receiver can accept an external RF cable connection (input) from a terrestrial, CCTV or CATV signal source. When the receiver is switched on for receiving direct-broadcast satellite programming services, this external RF cable connection is automatically disabled, electrically disconnecting this external signal source from the receiver. When the receiver is switched off (i.e., to STANDBY), the external signal source passes through the receiver to your TV monitor and/or other A/V equipment.

## ...About the EXPANSION PORT

Your Business Satellite Receiver can be operated and monitored remotely via the EXPANSION PORT when connected to a PC workstation or data terminal. Remote receiver operation requires installation of a PC/data communications program. Note that certain program settings may vary, depending on the type of workstation/terminal equipment being used. Data interface cables connected between the Business Satellite Receiver and some customer equipment may require a unique pin-out for proper operation via the EXPANSION PORT (DB-25 female connector). For port pin-out information, see the accompanying table. Note that only those EXPANSION PORT pins used are shown (i.e., all other pins are unused, or are not required for normal operation).

## ...About the WIDEBAND DATA port

Your Business Satellite Receiver can transmit synchronous Wideband Broadcast Data via the WIDEBAND DATA port when connected to a PC workstation, data terminal or other (serial) data communications equipment. Using the receiver WIDEBAND DATA port to transfer large files (e.g., KenCast™ data) via authorized Wideband Broadcast Data uplink service requires special PC hardware and software that is commercially available. Note that certain program settings may vary, depending on the type of workstation/terminal equipment being used. For more information, contact your dealer/reseller or local service provider.

Data interface cables connected between the WIDEBAND DATA port (DB-9 female connector) and some customer equipment may require a unique pin-out for proper operation. For port pin-out information, see Table 2. Note that only those WIDEBAND DATA port pins used are shown (i.e., all other pins are unused, or are not required for normal operation). For more information about Wideband Broadcast Data, see "Available Services menu".

Table1. EXPANSION PORT pin-out

Pin	Function	Pin	Function
1	Chassis Ground	22	Control output #4
2	Low Speed Data (up to 38.4 kbps)	23	Control output #3
7	Signal Ground	24	Control output #2
12	Remote Rx (input)	25	Control output #1
13	Remote Tx (output)		
20	+5 VDC control output via 1K $\Omega$ pull-up resistor		
21	+5 VDC control output via 47 $\Omega$ pull-up resistor		

Table2. WIDEBAND DATA port pin-out

Pin	Function
1	p/o balanced output (Tx Data +)
6	p/o balanced output (Tx Data -)
2	p/o balanced output (clock signal +)
7	p/o balanced output (clock signal -)
5	Signal Ground

Support for the following Wideband Broadcast Data rates is provided.

- ☐ 421.8750 kb/s
- ☐ 843.7500 kb/s
- ☐ 1.6875 Mb/s
- ☐ 3.3750 Mb/s
- ☐ 6.7500 Mb/s
- ☐ 13.5000 Mb/s

## TV & RF plus optional connections

The accompanying figure shows the cable connections required for the satellite LNB and TV monitor plus other (optional) connections that can be made from the rear panel of your Business Satellite Receiver. As many, different equipment configurations are possible, use the following information as a guide only. If you need assistance to identify your specific equipment configuration needs, contact your dealer / reseller or local service provider (see also "Connecting your system").

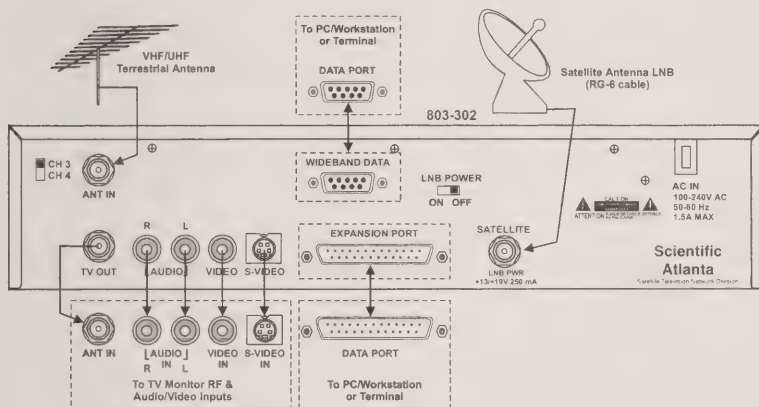


Figure 4. TV & RF plus optional connections (NTSC model with Wideband Data option shown)

### TV tuner/converter channel setting...

- ☐ **NTSC models only** Set the TV modulator selector switch (near TV OUT connector) to the correct channel for receiving video signals via your TV tuner/converter
  - ☐ **PAL models only** (1) Switch the receiver ON [press the ON/STANDBY button] (2) Set the TSG (Test Signal Generator) switch (near ANT IN connector) to ON for displaying the output test signal (3) Set the TV modulator rotary selector switch (near UHF OUT connector) to the correct channel for receiving video signals via your TV tuner/converter
- Note:** After setting the correct PAL tuner/converter channel, be sure to set the TSG switch to OFF, or the normal TV signal will not be available

### Satellite antenna LNB and TV monitor connection...

- ☐ Connect the coaxial RF cable from the satellite antenna LNB to the receiver RF IN jack
- ☐ Connect a coaxial RF cable from the receiver TV OUT jack to the VHF IN jack of your VCR (Hint: Some VCRs and TVs label this connection RF IN, VHF IN or UHF/VHF IN)

### CATV/CCTV cable or terrestrial VHF/UHF TV antenna connection...

- ☐ Connect the coaxial RF cable from the external cable/TV source or terrestrial VHF/UHF antenna to the receiver ANT IN jack

### VCR connection...

- ☐ Connect shielded A/V cables from the L (Left) and R (Right) receiver AUDIO jacks and VIDEO jack to the AUDIO IN and VIDEO IN jacks of your VCR

### S-Video (S-VHS) TV or VCR connection...

- ☐ Connect a cable from the receiver S-VIDEO connector to the S-Video connector on your TV or VCR (see also "Connecting your system").

### SCART TV or VCR connection...

- ☐ **PAL models only** Connect a SCART cable from the receiver TV/VCR (SCART) connector (see Figure 3 on previous page) to the SCART connector on your TV or VCR
- Note:** Connecting a SCART cable directly to your TV monitor or VCR permits some or all of the separate video/audio connections to be safely removed or switched out without affecting receiver video and/or audio output signals

### EXPANSION PORT connection...

- ☐ Connect a shielded 25-pin D cable from the receiver EXPANSION PORT to the data port of your PC/workstation or data terminal (see Table 1 on previous page for EXPANSION PORT connector pin-out)

### WIDEBAND DATA port connection...

- ☐ Connect a shielded 9-pin D cable from the receiver WIDEBAND DATA port to the data port of your PC/workstation, data terminal or other (special) data communications equipment (see Table 2 on previous page for WIDEBAND DATA port connector pin-out)



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# Operating the receiver

This Installation and Operation Guide provides all the information you need to setup and operate your PowerVu Business Satellite Receiver.

## Before you get started

Before proceeding, check that your Business Satellite Receiver is correctly installed as part of your Video/Audio system. Before you can operate the receiver, it must be properly connected to your satellite LNB antenna, TV monitor and to other A/V equipment, as required. For information about installing and connecting the receiver, refer to this guide. If you need assistance with the installation of your Business Satellite Receiver or satellite antenna, or with connecting or modifying your equipment installation, contact your dealer/reseller or local service provider for assistance. For product identification and other/servicing information, see the Appendices.

# Front panel controls & display

The front panel of your Business Satellite Receiver provides controls for switching the receiver on and off, and for interfacing with the Remote Control and Smart Card. Power and signal presence indicator LEDs are also provided. Some Remote Control buttons are duplicated on the front panel for activating and navigating menus. An introduction to each of the front panel buttons and indicators follows.

## On/Standby button

The ON/STANDBY button switches the Business Satellite Receiver on and off (standby).

To switch the receiver on or off from the front panel...

Press ON/STANDBY .....



When the receiver is switched on, the power indicator LED is ON. When switched off (standby), the indicator LED flashes regularly. You can also switch the receiver on and off using the Remote Control POWER button (see “Remote Control functions”).

## Signal indicator LED

The Signal indicator LED is ON when your Business Satellite Receiver is synchronized with the incoming digital video signal. If no incoming signal is detected or recognized by the receiver, or if the receiver setup is incorrect, this LED is OFF. If the incoming signal or signal synchronization is temporarily interrupted or lost, this LED may turn OFF or may flicker (i.e., turn ON and OFF intermittently). For more information about troubleshooting your Business Satellite Receiver, see the Appendix.

## Menu button

While viewing any channel you can use the MENU button (front panel) to display the Main Menu.

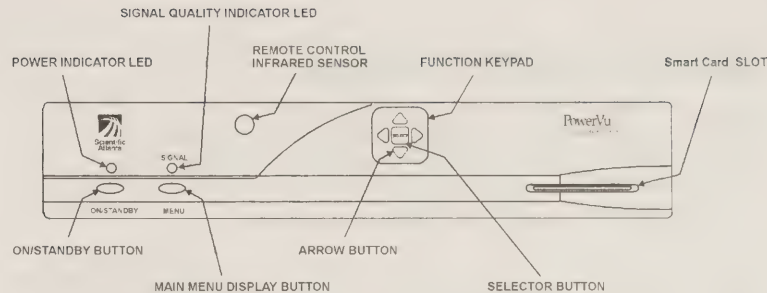


Figure5. Front panel controls and display





## To display the Main Menu...

Press MENU .....





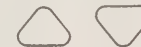
You can also display the **Main Menu** from the Remote Control by pressing the MENU button (see “Remote Control functions”).

## Multi-Function keypad

Use the , ,  and  arrow buttons and the SELECT button to operate the on-screen menus. For complete information about Multi-Function keypad operation, see (see “Remote Control functions”).

## To use the arrow buttons and the SELECT button...

Press  and  .....



Press  and  .....



Press SELECT .....



## Smart Card slot

Security upgrades for preauthorized satellite broadcast services via Smart Card are planned for the future.

# Remote Control functions

The Remote Control for your Business Satellite Receiver lets you control receiver functions. You can switch power on and off plus activate and navigate the on-screen menus. The Remote Control operates by transmitting an invisible infrared beam that is detected by a sensor in the receiver front panel.

To operate the Remote Control transmitter, simply aim it at the front panel and press the appropriate button(s). See the accompanying figure. Some Remote Control functions are duplicated on the front panel (see also "Front panel controls & display").

An introduction to each of the Remote Control buttons follows. Note that some Remote Control button functions may not operate with your Business Satellite Receiver, or may be currently unavailable.

## Simply point and press

Using the Remote Control to operate your Business Satellite Receiver is easy. Simply point and press. You can power on the receiver, activate the on-screen menus and set menu options.

## Menu button

Use the Menu button to display the Main Menu and to return to the current channel (see "Front panel controls & display").

### To display the Main Menu...

Press MENU



You can display the Business Satellite Receiver Main Menu using front panel or Remote Control buttons. For quick reference, use the handy guide printed on the back cover of your Remote Control transmitter.

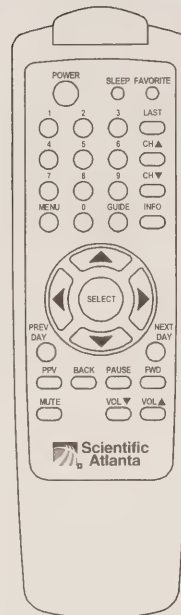


Figure 6. Remote Control transmitter

## Power button

Use the POWER button to switch the Business Satellite Receiver on and off (standby).

### To switch power to the receiver ON or OFF...





Press POWER






You can also switch the receiver on and off from the front panel using the ON/STANDBY button (see "On/Standby").



# Multi-Function keypad

The multi-function keypad includes the , ,  and  arrow buttons and the SELECT button. Use the arrow buttons and the SELECT button to operate the on-screen menus. The arrow buttons are found on the Remote Control transmitter and on the front panel together with the SELECT button. You use the SELECT button separately to make selections from on-screen menus, and together with the arrow buttons to perform special functions (see also “Front panel controls & display”).

While viewing any channel you can use the  arrow buttons to display (higher or lower) channels, and the  arrow buttons to increase or decrease the volume level, respectively. Other Remote Control buttons can also be used to increase or decrease the volume and to change channels (while displaying the current program). Note that  arrow buttons control available channels only (see also “Changing channels” and “Changing the volume”).

## To use the arrow buttons and the SELECT button...

Press  and 

Press  and 

Press SELECT



# Numeric keypad

While viewing any channel you can use the numeric keypad to change to any channel from 001 through 999. You can also use the numeric Remote Control buttons to enter information for menu options (see “...About entering numbers using the Remote Control”).

## To use the numeric keypad...

Press 0 through 9



# Changing channels

While viewing any virtual channel you can change channels (higher or lower) one channel at a time. Channels are changed (higher or lower) depending on which button is pressed. You can also change channels using other Remote Control buttons.

## To change channels...

Press CH  and CH 



# Last channel display

While viewing any channel you can return to the last or previous channel. The previous channel can be any virtual channel.

## To display the last channel...

Press LAST



# Next Day display

While viewing any channel you can select from available language subtitles, if enabled. The next language subtitles option is the next option, in order (see Table 6 for available options).

## To display the next language subtitles option...

Press NEXT DAY



## Previous Day display

While viewing any channel you can select from available language subtitles, if enabled. The previous language subtitles option is the previous option, in order (see Table 6 for available options).

To display the previous language subtitles option...

Press PREVIOUS DAY ..... 



## Changing the volume

While viewing any channel you can increase or decrease the volume level. The volume level is increased or decreased depending on which button is pressed.

To change the volume...

Press VOL  and VOL  .....  

## Muting the volume

While viewing any channel you can temporarily mute or minimize the volume level. To return to the previous volume level, press the MUTE button again, or press the VOL  or VOL  button.

To mute the volume...

Press MUTE ..... 

# Menus at-a-glance

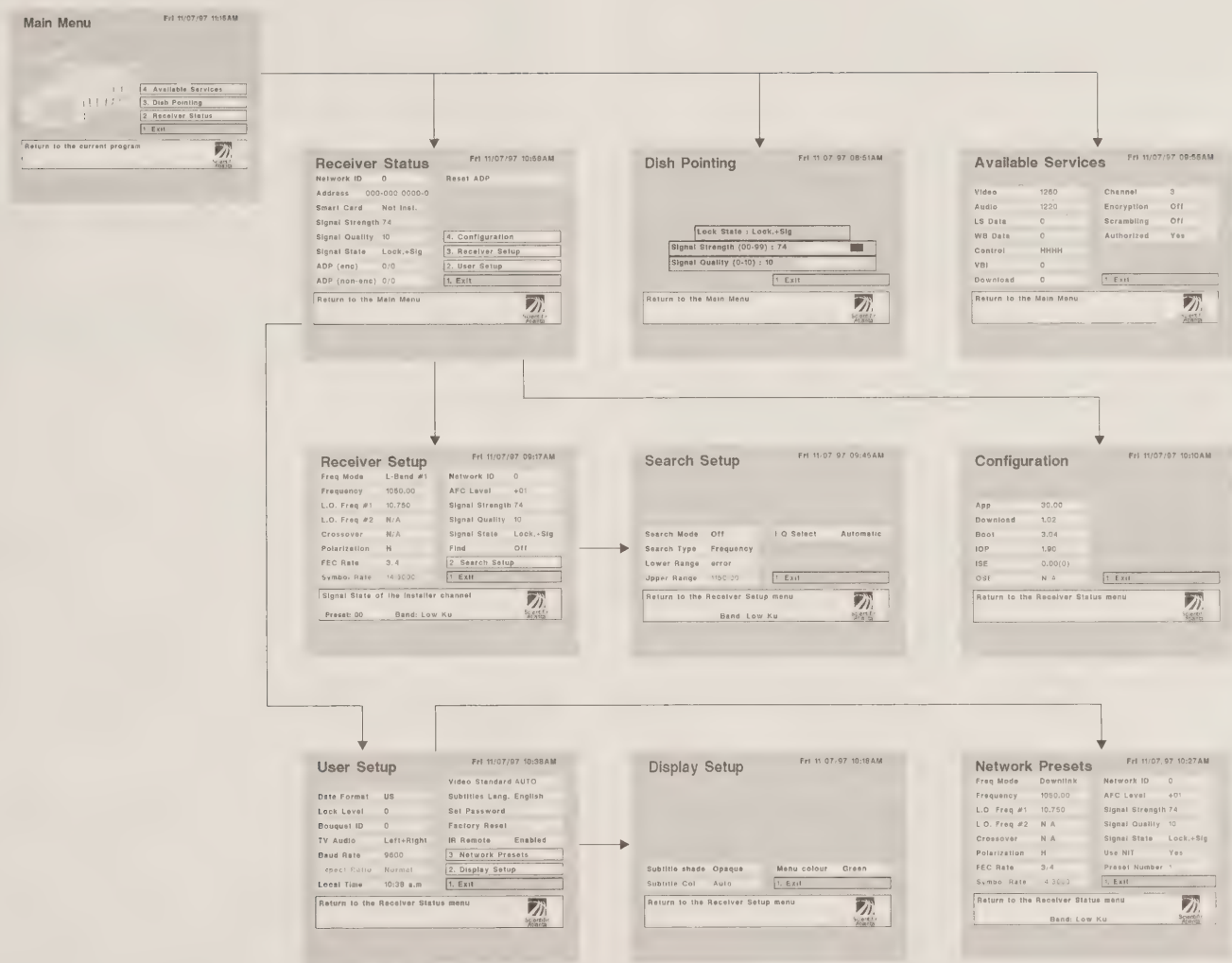


Figure7. Menus at-a-glance



# Setting up the receiver

This section contains all the information you need for setting up your PowerVu Business Satellite Receiver and antenna installation, including signal search. Before you begin using the receiver, or if you are modifying your equipment installation, you may need to change the current settings to suit your operating requirements.



**IMPORTANT!** Access to your PowerVu Business Satellite Receiver and to on-screen menus is Password-protected. Depending on the current Lock Level setting, you may be prompted for the Password before you can display menus, or when making changes to the current receiver setup. Note that if Lock Level 3 is currently set, pressing the MENU button displays a password prompt.

Because some or all of your receiver setup is Password-protected, you may or may not be permitted to make changes to the current settings. Receiver setup and display options are available from on-screen menus you display by pressing Remote Control or receiver front panel buttons.



**IMPORTANT!** Depending on the current Lock Level setting or receiver model, options that appear white on-screen are unavailable for selection, and/or are not installed. For example, if your receiver is not equipped with the Aspect Ratio option, it will appear white on-screen. Alternately, options available for selection appear black.

## Using the front panel and your Remote Control you can...

- ☐ Activate and navigate the on-screen menus
- ☐ View or change the current receiver setup
- ☐ Select and view available satellite programs or events

## Receiver Setup

Fri 11/07/97 09:17AM

Freq Mode	L-Band/#1	Network ID	0
Frequency	1050.00	AFC Level	+01
L.O. Freq #1	10.750	Signal Strength	74
L.O. Freq #2	N/A	Signal Quality	10
Crossover	Save Changes? 1:Yes	Signal State	Lock,+Sig
Polarization	2:No 3:Cancel	Lock	Off
FEC Rate	3/4	Search Setup	
Symbol Rate	14.3000	1. Exit	

### Signal State of the installer channel

Band: Low Ku



Figure 8. Save pop-up menu display

## ...About operating the on-screen menus

While viewing any channel, you can display on-screen menus for viewing or changing the current receiver setup. While in menus, you can change the current receiver settings, and/or display other menus. Some menus contain setup information which is available for viewing only, and cannot be changed. Numbered menu options are used to display other menus. Access to menus and changeable menu options is controlled by system Lock Levels and a security Password. For more information about Lock Levels and the Password, see "User Setup menu".

### To display on-screen menus...

- ☐ Press the **MENU** button on the Remote Control or receiver front panel.

### To change a receiver setting...

**Step 1.** Move to the desired setting using the **↑**, **↓**, **←** and **→** arrow buttons.

**Step 2.** For numeric options, press **SELECT** to clear the display, enter the number and then press **SELECT** again. For all other options, press **SELECT** repeatedly to display available settings.

**Step 3.** After making changes, move to Exit and press SELECT, or press 1 and then press SELECT. This action displays the Save pop-up menu.

**Step 4.** Press 1 to save the new configuration.

More information about using the Remote Control to enter numbers, and about saving changes to the current receiver setup is found on the next page.

#### To display another menu, or exit from the current menu...

**Step 1.** Move to the desired menu option using the **↑**, **↓**, **←** and **→** arrow buttons and press SELECT, or...  
Press the number displayed at the menu option (left) and then press SELECT.

When you select EXIT or if you press the MENU button after making changes, a pop-up menu displays available Save options (see "...About saving changes").

#### To display the Main Menu (if Lock Level 3 set)...

**Step 1.** Press the MENU button.  
An on-screen prompt displays for entering the current Password.

**Step 2.** Enter the current Password and press SELECT to display the Main Menu (for security, a default character is substituted for each number pressed).

For more information about the Password, see "User Setup menu".

## ...About entering numbers using the Remote Control

Some menu options let you enter values directly using Remote Control buttons. To enter numbers directly and to operate numeric functions, perform the following actions.

**Step 1.** Press **SELECT** (after moving to the desired option) to replace the current setting. This action also clears the display.

**Step 2.** Press the numbered Remote Control buttons to enter the number.  
Each number entered is displayed on-screen (decimal places may also display automatically). If you make a mistake while entering numbers, press the **←** or **→** arrow button to clear the entry and start again.

**Step 3.** Press **SELECT** after completing the numeric entry.



**IMPORTANT!** Exiting to video from menus after saving changes made to the current setup at the Receiver Setup menu only is always preceded by the installer channel banner display. The installer channel is a reserved channel associated with the current setup, and is usually channel zero (0). Return to video programming by pressing the CH **↑/↓** or the Up/Down **↑/↓** multi-function buttons, or you can change channels directly using numbered Remote Control buttons.

If you press SELECT to clear the entry, pressing the **↑** or **↓** arrow button displays available options (numbers) in fixed steps.

Repeat this action to change the current setting. If a value entered is out of range or conflicts with another setting, a pop-up message displays information about the error, or substituted (default) value. For a list of frequency-related error messages, see Table 4.

## ...About saving changes

After making changes to current receiver setup, you can select EXIT to return the previous menu, or you can press the MENU button to exit to video. Before exiting, you must save or discard any changes. Saved changes are used to update the current receiver settings. Discarding changes restores the previously saved settings. You can also cancel the operation to make further changes.

When you select EXIT or if you press the MENU button after making changes, a pop-up menu displays available Save options (see Figure 8). After changes are saved, you are automatically returned to the previous menu.

#### After changing the current receiver setup you can...

- ☐ **Save:** Press 1 to save the new settings (YES)
- ☐ **Discard:** Press 2 to discard all changes (NO)
- ☐ **Cancel:** Press 3 to cancel the operation (CANCEL)

Note that immediately after saving changes, you are automatically returned to the previous menu.

If no Remote Control is available, you can perform these functions using the following front panel buttons.

- ☐ **Save:** Press and hold down both the **←** and **→** arrow buttons simultaneously to save the new configuration (YES)
- ☐ **Discard:** Press and hold down both the **↑** and **↓** arrow buttons simultaneously to discard all changes (NO)
- ☐ **Cancel:** Press SELECT to cancel the operation (CANCEL)



**WARNING!** Saved settings are automatically restored when the receiver is restarted after AC power is switched off or interrupted. Upon restarting, the receiver defaults to the last virtual channel displayed for more than 20 seconds after exiting from menus (see also "...About Lock Levels").

## ...About the current channel

When you navigate to menus from video, the information displayed is associated with the current (video) channel, which is displayed on-screen at the Available Services menu. If no changes have been made to the current setup, you are automatically returned to the same video channel when you exit to video. If any changes have been made (at the Receiver Setup menu only), exiting to video from menus after saving changes is always preceded by the installer channel banner display. Note that changes made at any other menu permit direct return to the previously-watched channel (see also "Available Services menu").

## ...About changing the Video Standard

The Video Standard used to operate the receiver is preset at the factory to either NTSC (525-line), or PAL (625-line). Changing the Video Standard is normally required only for operating the receiver in a network or jurisdiction that uses the alternate Video Standard, and/or when new (or different) subscriber services are made available.

Changing the Video Standard or resetting the receiver to the default factory settings may cause the TV video to display improperly. If the current Video Standard setting is incompatible with subscriber/network services, it must be changed. For information about factory default settings, see "User Setup menu".

### To change the Video Standard...

#### Step 1. Change the Video Standard, if required (receiver front panel only):

- (a) Press and hold the SELECT button, then...
- (b) Press the **↑** arrow button twice to replace the current setting.
- (c) Press the **↑** arrow button twice again to select the alternate Video Standard.

Repeat this step to change the Video Standard (refer also to the "Quick Setup Guide").

## ...About the Network ID

Operating the Business Satellite Receiver in a DVB<sup>1</sup> network requires a valid Network ID. This number must be correctly set to match the Network ID associated with the uplink signal. Similarly, if your subscriber/network services require a Bouquet ID<sup>2</sup>, it must also be correctly set to match the uplink signal Bouquet ID. Loss of service will result if the receiver Network ID and/or Bouquet ID does not match the uplink signal Network/Bouquet ID information. If you are unsure about which Network/Bouquet ID to use, contact your dealer/reseller or local service provider.

The Network ID used to operate the receiver is preset at the factory (i.e., to 1). The Bouquet ID (if used) is also preset at the factory (i.e., to 0). Changing the Network/Bouquet ID or resetting the receiver to the factory default settings may cause loss of service. If the Network/Bouquet ID required for your uplink service is unknown or is incorrect, it must be correctly identified and set. For information about factory default settings, see "User Setup menu".

---

<sup>1</sup> Digital Video Broadcasting

<sup>2</sup> Subnetwork ID required by some DVB networks



# Receiver Setup menu

Setting up your Business Satellite Receiver for normal operation requires setup of frequency-related and other options from the Receiver Setup menu, and from other menus. These settings are used by the receiver for locking onto the signal, and for optimizing receiver performance (see also “User Setup menu” and “Search Setup menu”).

Most of the functions needed to set up your Business Satellite Receiver are available from the Receiver Setup menu. You can view or change the current setup.

To display the Receiver Setup menu...

- Step 1. Display the Main Menu (see Figure 7).
- Step 2. Move to **Receiver Status** and press SELECT.
- Step 3. Move to **Receiver Setup** and press SELECT.

**Available options:** Select SEARCH SETUP (or press 2 and then SELECT) to display the Search Setup menu, or select RECEIVER STATUS (or press 3 and then SELECT) to display the Receiver Status menu.

## ...About frequency settings

As you make changes to the current setup (at the Receiver Setup menu), the receiver checks that the Local Oscillator frequencies, Crossover frequency, Frequency and Frequency Mode settings are compatible with each other. A Crossover frequency is required only if you are using both Local Oscillators (i.e., you have a dual-band LNB and you are entering a Frequency with Downlink Mode set). If used, the Local Oscillator Frequency #2 must be greater than Local Oscillator Frequency #1. The operating Frequency, Local Oscillator frequencies plus the Crossover frequency must be correctly set as specified by your antenna/LNB manufacturer, dealer/reseller or local service provider. The Frequency setting plus other settings used depend on subscriber/network services available, and may vary.

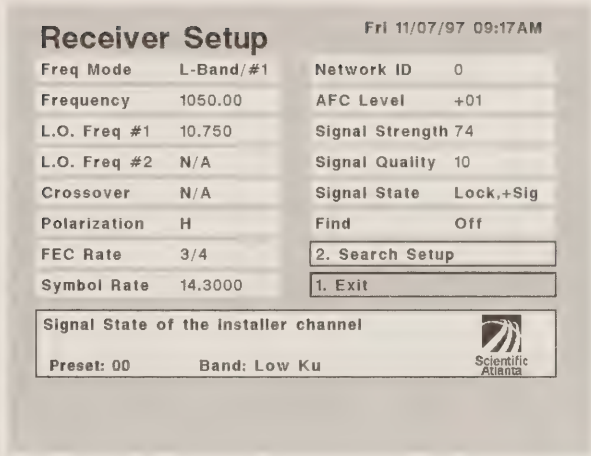


Figure9. Receiver Setup menu display

You can enter a valid frequency using the numbered Remote Control buttons, and/or you can use the  $\uparrow/\downarrow$  arrow buttons to display available settings. If the current setting is out of range or is incompatible with other settings, a pop-up message displays setup error information, or N/A (Not Applicable) will display for the setting. Setup errors must be corrected before the new setup can be saved. For information about saving changes, see “...About saving changes”.

The relationships between the Downlink frequency, the Local Oscillator frequency and the resulting L-Band (operating) Frequency are shown in the accompanying table for both C-Band (3.7 GHz through 4.2 GHz) and Ku-Band (10.7 GHz through 15 GHz) operation.

Table3. C and Ku-Band frequency calculations

Band	L-Band (operating) frequency calculation
C-Band	$L\text{-Band frequency} = f^1 \text{ (Local Oscillator)} - f \text{ (Downlink)}$
Ku-Band	$L\text{-Band frequency} = f \text{ (Downlink)} - f \text{ (Local Oscillator)}$

<sup>1</sup> Frequency

Pop-up error messages that display for invalid settings are listed in Table 4. Use this information to help you correct frequency-related receiver setup errors. The pages that follow contain detailed setup information for each Receiver Setup menu option.

Table 4. Pop-up error messages

#### Displayed Messages

Local Oscillator frequency #2 is not valid for Ku-Band

Local Oscillator frequency #2 is less than Local Oscillator Frequency #1

Downlink frequency entered is out of range

Downlink frequency calculated from L-Band is out of range

L-Band frequency calculated from Downlink is out of range

#### To set the Frequency Mode...

**Step 1.** Move to **Freq Mode** and press SELECT to display available settings (L-Band/1, L-Band/2 or Downlink). The default setting is L-Band/1.

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another Frequency Mode. A valid Frequency Mode is always required (i.e., for setting the L-Band or Downlink frequency).

#### To set the operating Frequency...

**Step 1.** Move to **Frequency** and press SELECT to replace the current setting.

**Step 2.** Enter a valid frequency and then press SELECT. You can also press the  $\uparrow/\downarrow$  arrow buttons to display available settings (frequencies are displayed from 950 MHz through 2150 MHz [L-Band] and from 0 GHz through 15 GHz [Downlink] in 250 kHz steps). The default setting is 950 MHz.

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another frequency. A valid operating Frequency is always required (i.e., for setting the L-Band or Downlink frequency).

#### To set the Local Oscillator #1 frequency...

**Step 1.** Move to **LO Freq #1** and press SELECT to replace the current setting.

**Step 2.** Enter a valid frequency and then press SELECT. You can also press the  $\uparrow/\downarrow$  arrow buttons to display available settings (frequencies are displayed from 0 GHz through 15 GHz in 1 MHz steps). The default setting is 9.750 GHz.

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).



Repeat this action to change to another frequency. A Local Oscillator #1 frequency setting is required only if Downlink or L-Band/1 Frequency Mode are set (N/A<sup>1</sup> displayed if Frequency Mode set to L-Band/2).

#### To set the Local Oscillator #2 frequency...

**Step 1.** Move to **LO Freq #2** and press SELECT to replace the current setting.

---

<sup>1</sup> Not Applicable

**Step 2.** Enter a valid frequency and then press SELECT. You can also press the / arrow buttons to display available settings (frequencies are displayed from 0 GHz through 15 GHz in 1 MHz steps). The default setting is 10.600 GHz.

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another frequency. A Local Oscillator #2 frequency setting is required only if the Downlink or L-Band/2 Frequency Mode is set (N/A<sup>1</sup> displayed if Frequency Mode set to L-Band/1, or if operating Frequency in C-Band range [3.7-4.2 GHz]). The Local Oscillator #2 frequency used must be greater than the Local Oscillator #1 frequency.

#### To set the Crossover frequency...

**Step 1.** Move to **Crossover** and press SELECT to replace the current setting.

**Step 2.** Enter a valid frequency and then press SELECT. You can also press the / arrow buttons to display available settings (frequencies are displayed from 10.7 GHz through 15 GHz in 250 kHz steps). The default setting is 11.700 GHz.

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another frequency. A Crossover frequency setting is required only if the Downlink Frequency Mode is set (N/A<sup>1</sup> displayed if Frequency Mode set to L-Band/1 or L-Band/2 [not dual Ku-Band LNB operation]). The Crossover frequency setting determines which LNB is used (only for dual-LNB operation).

#### To set the antenna LNB polarization...

**Step 1.** Move to **Polarization** and press SELECT to display available settings (H [Horizontal], H (Fixed), V [Vertical]) or V (Fixed). The default setting is H (Horizontal).

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the polarization. When a Horizontal polarization is set, a 19 volt DC signal is output via the receiver rear panel RF IN connector. When a Vertical polarization is set, a 13 volt DC signal is output via this connector. Observe the effect of the polarization change by checking the displayed relative Signal Strength and Signal Quality values (see Figure 9). Higher numbers are better. If you are unsure about which polarization to use, contact your dealer/reseller, or local service provider.

#### To set the FEC rate...

**Step 1.** Move to **FEC Rate** and press SELECT to display available settings (1/2, 2/3, 3/4, 5/6, or 7/8). The default setting is 7/8.

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the FEC Rate. The selected FEC Rate must match the FEC Rate associated with the transmitted signal. If you are unsure about which FEC rate to use, contact your dealer/reseller, or local service provider.

### To set the Symbol Rate...

- Step 1.** Move to **Symbol Rate** and press SELECT to replace the current setting.
- Step 2.** Enter a valid Symbol Rate using the numbered Remote Control buttons and then press SELECT. You can also press the  $\uparrow/\downarrow$  arrow buttons to display available settings (Symbol Rates are displayed from 3 MS/s through 30.8000 MS/s in 10 KS/s steps). The default setting is 28.3465 MS/s.
- Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another Symbol Rate. The selected Symbol Rate must match the Symbol Rate associated with the transmitted signal. If you are unsure about which Symbol Rate to use, contact your dealer/reseller, or local service provider.

### To set the Network ID...

- Step 1.** Enter a valid Network ID (number) and then press SELECT. You can also press the  $\uparrow/\downarrow$  arrow buttons to display available settings (numbers are displayed from 0 through 65535).
- Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Network ID (see also "...About the Network ID"). Changing the Network ID is normally required only when authorized subscriber services are changed, or when new or different subscriber services are made available (see Figure 9). If you are unsure about which Network ID to use, contact your dealer/reseller, or local service provider. Changing the Network ID may also require that you execute a signal search (see "Search Setup menu" and "...About the Find option").

## ...About the Signal State

During normal operation, your receiver is synchronized with the received LNB signal (confirmed by the "Lock, Sig" status display). If the receiver is able to synchronize to a carrier frequency only and no MPEG stream is present or is recognized, the "Lock, No Sig" status is displayed, and the Signal indicator LED is OFF. If no digital carrier signal is detected, the "No Lock" status is displayed, and the Signal indicator LED is also OFF. If a signal search activated using the "Find" option is in progress, the "Searching" status is displayed. If a signal search activated using the Search function is in progress, the message "Searching for a signal" is displayed. For more information about the Find option, see "...About the Find option". For more information about signal searches, see "...About the Search option".

## ...About the Find option

Searching for a signal with the "Find" option can be used if you are installing your Business Satellite Receiver for the first time, or if you are modifying the current receiver setup. Activating the Find function forces the receiver to search for a signal immediately. Signal searches are also performed automatically to restore normal receiver operation if the received signal is interrupted or lost, or is changed by the local broadcast satellite services provider.



Once activated, the receiver begins searching for a signal associated with any Network ID. When a possible match is found, the search is temporarily interrupted while the receiver attempts to synchronize with the found signal. If synchronization is successful, the “*Lock, Sig*” status is displayed on-screen, and the settings can be saved, as required before exiting to video (current channel). If receiver synchronization cannot take place, the signal is discarded and the signal search is automatically resumed. If no signal is found, the signal search continues indefinitely, and must be manually terminated (see also “...About the Search option” and “...About the Signal State”).

### To Find a signal...

- Step 1.** Move to **Find** and press SELECT to display ON—activating the signal search (available options are ON and OFF).
- Step 2.** When a signal is found (“*Lock, Sig*” status display), move to Exit and press SELECT (or press 1 and then SELECT).  
A pop-up menu displays Save options.
- Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to search for (i.e., Find) another signal. When the settings are saved, the Find option is automatically set to OFF. You can also terminate the search manually by setting the Find option to OFF.

# User Setup menu

Setting up your Business Satellite Receiver for normal operation requires that user-related options be set from the User Setup menu. These settings are used for optimizing receiver performance (see also "Receiver Setup menu" and "Search Setup menu").

## To display the User Setup menu...

**Step 1.** Display the Main Menu (Figure 7).

**Step 2.** Move to **Receiver Status** and press SELECT.

**Step 3.** Move to **User Setup** and press SELECT.

You can view or change the current setup. Your dealer/reseller or local service provider can advise you about what receiver settings you may need to change (see also "Search Setup menu"). Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu.

## ...About Lock Levels

Five (5) unique Lock Levels are available for protecting your Business Satellite Receiver and the current receiver settings against unauthorized use or modification (see Table 5). A Lock Level 0 setting lets you make any changes to the current receiver setup. Lock Levels 1 and 2 limit access to settings that cannot compromise the video signal. When the receiver setup is protected via Lock Levels 3 or 4, access to menus is blocked to preserve the current receiver setup, and only the current (or Last) channel is available for viewing (see IMPORTANT). At Lock Level 3, only POWER, MUTE, VOL $\uparrow$  and VOL $\downarrow$  functions are available. Lock Level 4 is identical to Lock Level 3, except it can only be changed via remote terminal or PCC uplink signal. Note that after setting the Lock Level to 3, you are automatically returned to video after exiting the User Setup menu (i.e., moving to Exit and pressing SELECT).

Receiver Lock Levels are Password-protected. When an attempt is made to change the Lock Level setting (Lock Level 2 or lower), a Password prompt displays (see Figure 11). After the correct Password is entered, you can change the Lock Level setting. If Lock Level 3 is currently set and MENU button is pressed, a banner displays with a password prompt. After the correct Password is entered, the Main Menu displays, and the receiver Lock Level is automatically set to Level 0. If

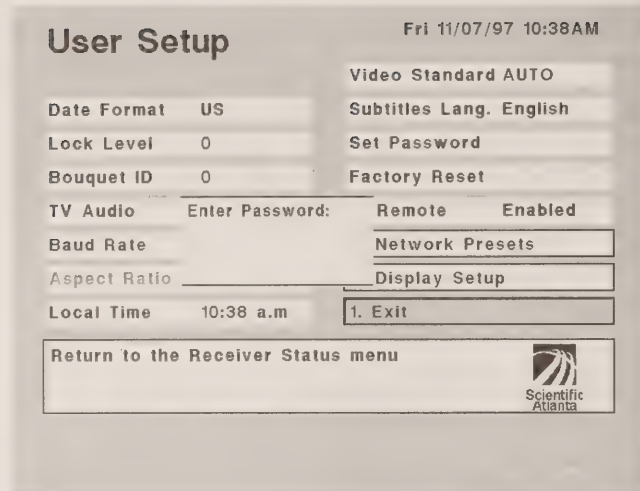


Figure 10. User Setup menu and Password prompt display

no password is entered, or if no other key or button is pressed within one (1) minute of the banner text message display, the current channel displays automatically.

If the incorrect Password is entered (any Lock Level setting), a message box displays to confirm the invalid Password entry, and access to the Main Menu (in the case of Lock Level 3), or to the Lock Levels option (User Setup menu) is denied. A Password prompt also displays when changing the Password (see Figure 10). See also "...About the Password". The accompanying table summarizes Lock Level settings and associated receiver options.





### IMPORTANT!

A virtual channel displayed for 20 seconds or more automatically becomes the current (Last) channel. As Lock Level 3 disables most Lock Level 0 functions (including channel changes), perform this action before changing the current Lock Level setting to 3 (see also "...About saving changes").

Table5. Available Lock Levels

Level	Description
0	All settings unlocked (receiver lockout disabled)
1	All settings unlocked except Factory Reset and Password options
2	All settings unlocked except Receiver Setup and User Setup <sup>1</sup> options
3	All settings locked (access via Password only)
4	All settings locked (access via remote terminal or PCC uplink signal only)

To change the Lock Level...

- Step 1.** Move to **Lock Level** and press SELECT to replace the current setting.
- Step 2.** Enter a valid Lock Level (number) and then press SELECT. You can also press the / arrow buttons to display available settings (Lock Levels are displayed from 0 through 3). The default setting is 0. A pop-up displays for entering the current Password.
- Step 3.** Enter the current Password and press SELECT (for security, a default character is substituted for each button pressed).
- Step 4.** Move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 5.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required. The receiver settings are enabled or disabled, depending on the Lock Level set.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Lock Level setting. Menu options appear grayed-out if disabled by the current Lock Level setting.

<sup>1</sup> Baud Rate and TV Audio options are unlocked

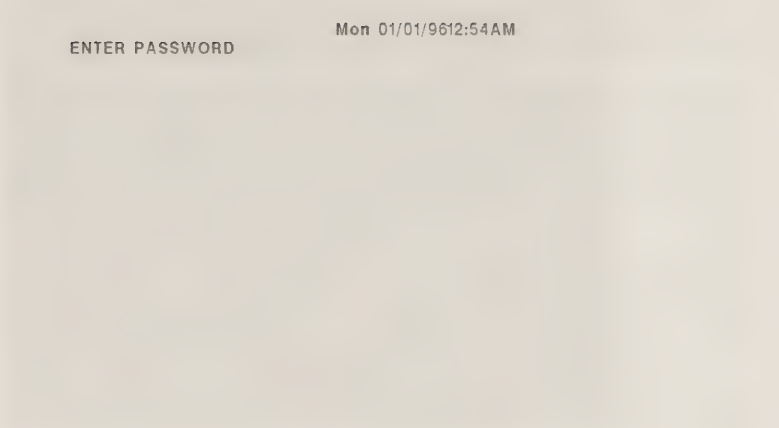




Figure11. Password prompt banner display

To display the Main Menu (if Lock Level 3 set)...

- Step 1.** Press the **MENU** button. An on-screen prompt displays for entering the current Password (see Figure 11).
- Step 2.** Enter the *current Password* and press SELECT to display the Main Menu (for security, a default character is substituted for each number pressed).

To set the Bouquet ID...

- Step 1.** Move to **Bouquet ID** and press SELECT to replace the current setting. If necessary, record the current Bouquet ID number for reference.
- Step 2.** Enter a valid Bouquet ID (number) and then press SELECT. You can also press the / arrow buttons to display available settings (numbers are displayed from 0 through 65535). The default setting is 0.
- Step 3.** When the *desired setting* is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Bouquet ID. Changing the Bouquet ID is normally required only when authorized subscriber services are changed, or when new or different subscriber services are made available (see "Search Setup menu"). Changing the receiver Bouquet ID may also require that you execute a signal search.

#### To set the modulated TV Audio output...

**Step 1.** Move to **TV Audio** and press SELECT to display available settings (L [Left], R [Right], or L+R [Left + Right]). The default setting is Left+Right.

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the modulated TV Audio output. Changing the TV Audio option setting modifies the audio signal routing from the receiver rear panel (see "Connecting your system"). If you are unsure about which audio routing to use, contact your dealer/reseller, or local service provider.

#### To set the Baud Rate (for external remote operation)...

**Step 1.** Move to **Baud Rate** and press SELECT to display available settings [600, 1200, 2400, 4800 or 9600 baud]. The default setting is 9600.

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another baud rate. If you are unsure about which baud rate to use, contact your dealer/reseller, or local service provider.

#### To set the Aspect Ratio...

**Step 1.** Move to **Aspect Ratio** and press SELECT to display available settings (Normal [4X3] or Wide Aspect<sup>1</sup> [16X9]). The default setting is Normal.

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Aspect Ratio. Setting the Aspect Ratio to Wide lets you view programming broadcast in 16 X 9 format on your TV monitor (only if enabled at uplink). If you are unsure about which aspect ratio to use, contact your dealer/reseller, or local service provider.

## ...About the local time

Current day, date and time information is displayed at the top of each menu. Time information is normally broadcast as part of the transmitted digital signal, and is usually the broadcaster local time relative to GMT<sup>2</sup>. If the current broadcast time is not your local time, you must change this time setting. Time information is displayed in the following format.

Day 00/00/00 00:00AM

#### To set the Local Time...


**Step 1.** Move to **Local Time** and press SELECT to replace the current setting.

---

<sup>1</sup> If available via uplink

<sup>2</sup> Greenwich Mean Time



**Step 2.** Press the  arrow button to advance forward or backward from the current time setting in one-half (½) hour increments over a 24-hour period (12:00 AM through 11:59 PM). The default setting is 12:00 AM.

#### To set the Video Standard...

**Step 1.** Move to **Video Standard** and press SELECT to display available settings [AUTO, NTSC, PAL-B, PAL-M OR PAL-N] ). The default setting is AUTO.

**Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays *Save options*.

**Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Video Standard. The Video Standard is initially preset to NTSC or PAL-B, depending on factory-installed options. Within your local network or jurisdiction, the local service provider may output a NTSC (525-line) or PAL-M (625-line) QPSK (downlink) signal. When set to AUTO, the receiver automatically displays video using the Video Standard associated with the QPSK (downlink) signal. When set to a specific Video Standard, the receiver displays video only when the current setting matches the Video Standard associated with the received signal. If the Video Standard (current setting) does not match the received signal, an on-screen message displays to confirm that the current setting is invalid.

If you are unsure about which Video Standard to use, contact your dealer/reseller, or local service provider (see also “...About changing the Video Standard”).




**IMPORTANT!** The current Video Standard setting is used by the receiver for correct display of the video (picture) only. The satellite receiver does not convert from one Video Standard to another, such as from NTSC (525-line) to PAL-B (625-line).

## ...About video subtitles

Your Business Satellite Receiver can decode and display video subtitles on-screen if this information is broadcast as part of the encoded digital signal. Video subtitling is defined at the uplink via PowerVu System software, and can be set for display in a number of different languages, or can be disabled. When available, subtitle text appears at the bottom of the TV monitor screen and is synchronized with video programming. If the current subtitle language setting is incompatible, unavailable or does not match the subtitle information in the received digital signal, no subtitles are displayed. When you disable video subtitling (i.e., OFF) and exit to video from menus, a banner text message displays to confirm that no subtitles will display. While in video, you can use the **Next Day/ Previous Day** Remote Control button to advance forward or backward through the available settings (see “Remote Control functions”). For a list of available subtitle languages, see Table 6.

#### To set the video Subtitles Language...

**Step 1.** Move to **Subtitles Lang.** and press SELECT to unlock the current setting.

**Step 2.** Press the  arrow button to advance forward or backward through the available settings (see Table 6). The default setting is OFF.

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays *Save options*.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Subtitles Language. If you are unsure about which language to use, contact your dealer/reseller, or local service provider.

To change the display characteristics of the subtitle language, refer to the Display Setup menu.

Table 6. Available video subtitle languages

Language	Language	Language
Arabic	Hebrew	Russian
Batak	Hindi	Sanskrit
Bengali	Hungarian	Serbian
Bulgarian	Indonesian	Sinhalese
Chinese	Irish	Spanish
Czech	Italian	Swedish
Dutch	Japanese	Tai
English	Korean	Tamil
Finnish	Malay	Thai
French	Multiple <sup>1</sup>	Ukrainian
Gaelic	Polish	Vietnamese
German	Portuguese	Undefined 1, 2, 3, 4, 5 and 6 <sup>2</sup>
Greek	Romanian	OFF (Disabled)

## ...About the Password

A unique Password (4-digit number) protects the current receiver settings against unauthorized changes. When changing the Password, record and keep this number in a secure location. The default password provided is...

Default Password 1234

It is recommended that you change the default Password to a different Password when the receiver is first installed, and periodically afterward, as required.

### To change the Password...

**Step 1.** Move to **Password** and press SELECT to display the Password prompt.  
A pop-up displays for entering the current password.

<sup>1</sup> Displays subtitle text in the selected language (from a pre-defined language group)

<sup>2</sup> Other languages may also be available for selection, depending on your network or jurisdiction (defined at uplink)

**Step 2.** Enter the current Password and press SELECT (for security, a default character is substituted for each button pressed).

A pop-up displays for entering the new Password.

**Step 3.** Enter the new Password and press SELECT (any number from 0000 through 9999 is valid).

A pop-up displays for confirming the new Password.

**Step 4.** Enter the new Password again and press SELECT.

A pop-up displays to confirm that the new Password is ready to use.

**Step 5.** Repeat this action to change the current Password. If you make an error or press the wrong button when entering the Password, press the  $\leftarrow/\rightarrow$  arrow buttons to cancel input, and start again. If the Password is lost or is unavailable, contact your dealer/reseller or local service provider for assistance.

## ...About factory defaults

The Factory Reset option is used for resetting the receiver to factory default settings. When activated, the current receiver settings are replaced by the default settings (see Table 7). After the factory defaults are restored, you can make any changes, as required. Current receiver settings can be replaced at any time.

### To restore the factory default settings...

- ☐ Move to **Factory Reset** and press SELECT.  
A pop-up menu displays available options (see Table 7).

### After selecting the Factory Reset option you can...

- ☐ **Restore factory defaults:** Press 1 to restore the factory defaults (YES)
- ☐ **Cancel:** Press 2 to cancel the operation (NO).

If no Remote Control is available, you can perform the these functions using the following front panel buttons.

- ☐ **Restore factory defaults:** Press and hold down both the  $\leftarrow$  and  $\rightarrow$  arrow buttons simultaneously to restore the factory defaults (YES)
- ☐ **Cancel:** Press and hold down both the  $\uparrow$  and  $\downarrow$  arrow buttons simultaneously to cancel the operation (NO)

## ...About the IR Remote Control

The IR Remote option is used for enabling or disabling Remote Control capability. When enabled (ON), you can operate the receiver using Remote Control or front panel buttons. When disabled (OFF), you can only use the front panel buttons to operate the receiver (no response to any Remote Control buttons pressed). You can enable or disable Remote Control operation at any time.

The IR Remote Control is supplied with the Business Satellite Receiver, and can also be purchased separately (specify part # 760-216). To order, contact your dealer/reseller or local service provider, or your local Scientific-Atlanta Customer Support Center (see “Appendix D Customer information”).

### To enable or disable Remote Control operation...

**Step 1.** Move to **IR Remote** and press SELECT to change the current setting (Enabled or Disabled). The default setting is Enabled.  
A pop-up menu displays available options (see Table 7).

**Step 2.** Press 1 to save the new setting (YES).

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

### To set Date Format...

**Step 1.** Move to **Date Format** and press SELECT to change the current setting. The default setting is US.

**Date Format** has two setting: US and Standard. If you select US, the date displayed in the upper right-hand corner of screens will be in month/day/year format. If you select Standard, the date will be in day/month/year format.

Table 7. Factory default settings

	Option	Menu	Default setting
1.	Frequency Mode	Receiver Setup	L-Band/1
2.	Frequency	Receiver Setup	950 MHz
3.	Local Oscillator #1	Receiver Setup	9.750 GHz
4.	Local Oscillator #2	Receiver Setup	10.600 GHz
5.	Crossover	Receiver Setup	11.700 GHz
6.	Polarization	Receiver Setup	H (Horizontal)
7.	FEC Rate	Receiver Setup	7/8
8.	Symbol Rate	Receiver Setup	28.3465 MSymbols/sec.
9.	Network ID	Receiver Setup	1
10.	Lock Level	User Setup	0
11.	Bouquet ID	User Setup	0
12.	TV Audio	User Setup	Left + Right
13.	Baud Rate	User Setup	9600
14.	Aspect Ratio	User Setup	Normal
15.	Local Time	User Setup	12:00 AM
16.	IR Remote	User Setup	Enabled
17.	Date Format	User Setup	US
18.	Video Standard	User Setup	AUTO
19.	Subtitles Language	User Setup	OFF
20.	Password	User Setup	1 2 3 4
21.	Search Mode	Search Setup	OFF
22.	Search Type	Search Setup	Frequency
23.	Lower Range	Search Setup	950 MHz
24.	Upper Range	Search Setup	2150 MHz
25.	IQ Select	Search Setup	Automatic
26.	UHF Channel Setting		38

# Search Setup menu

Automated signal search options are available from the Search Setup menu for setting up your Business Satellite Receiver (see also "Receiver Setup menu").

To display the Search Setup menu...

**Step 1.** Display the Main Menu (Figure 7).

**Step 2.** Move to **Receiver Status** and press SELECT.

**Step 3.** Move to **Receiver Setup** and press SELECT.

**Step 4.** Move to **Search Setup** and press SELECT.

**Available options:** Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu.

You can view or change the current setup. Your dealer/reseller or local service provider can advise you about what receiver settings you may need to change. The following Search setup information is displayed on-screen.

- ☐ Search Mode
- ☐ Search Type
- ☐ Lower Range
- ☐ Upper Range
- ☐ I/Q Select

## ...About the Search option

Searching for a signal with the "Search" option is used for restoring normal receiver operation if the received signal is interrupted or lost, or is changed by the local broadcast satellite services provider.

A signal search is enabled by setting the Search option to ON at the Search Setup menu, and is activated automatically only if the carrier signal is interrupted or lost for more than 20 seconds (with menus not displayed). If the lost carrier signal is recovered within 20 seconds, the receiver will attempt to synchronize with the last locked channel. If not available, the lowest channel available will be used, regardless of signal authorization. If the lost carrier signal is not recovered within this

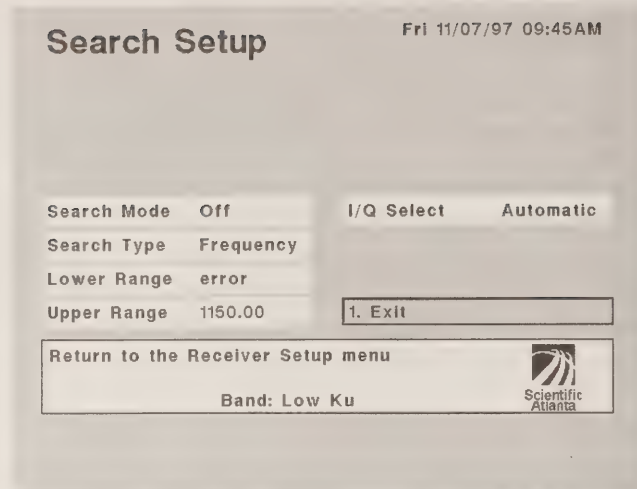


Figure12. Search Setup menu display

time, a signal search is activated automatically.

Once activated, the receiver begins searching for a signal associated with the current Network ID. When a possible match is found, the search is temporarily interrupted while the receiver attempts to synchronize with the found signal. If synchronization is successful, the signal status is displayed on-screen. Settings can be saved, as required while in the Search Setup menu before exiting to video (current channel). If receiver synchronization cannot take place, the signal is discarded and the signal search is automatically resumed. If no signal is found, the signal search continues indefinitely, and must be manually terminated. A signal search can also be manually terminated, or interrupted and resumed with different settings (see also "...About the Find option" and "...About the Signal State").



# ...About other Search Setup options

Signal searches are constrained or limited by the current Search Type and the boundary settings for the Lower and Upper Range. When searching for a signal, the receiver uses the Search Type as the primary search criteria. For example, if the FEC Rate is set as the Search Type, only signals that match the current FEC Rate (set at the Receiver Setup menu) within the current Lower/Upper Range frequency boundaries are examined for a possible match. Signals associated with all other FEC Rates are ignored (see also "...About I/Q signal inversion").

## To set the Search Mode...

- Step 1.** Move to **Search Mode** and press SELECT to display available settings (ON or OFF). The default setting is OFF.
- Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Setting the Search Mode to ON enables the signal search for automatic activation. You can disable the signal search option by setting the Search Mode to OFF.

## To set the Search Type...

- Step 1.** Move to **Search Type** and press SELECT to display available settings (see Table 8). The default setting is Frequency.
- Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.





**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Table 8. Available Search Type options

Option	Description
FEC Rate	Search by FEC Rate
Frequency	Search by Frequency

Repeat the above action to change the Search Type. If you are unsure about which Search Type to use for best results, contact your dealer/reseller, or local service provider.

## To set the Lower and Upper frequency ranges for the search...

- Step 1.** (a) Move to **Lower Range** and press SELECT to replace the current setting. (b) Enter a valid frequency and then press SELECT. You can also press the / arrow buttons to display available settings (frequencies are displayed in 250 kHz steps from 950 through 2150 MHz). The default setting is 950 MHz.
- Step 2.** (a) Move to **Upper Range** and press SELECT to replace the current setting. (b) Enter a valid frequency and then press SELECT. You can also press the / arrow buttons to display available settings (frequencies are displayed in 250 kHz steps from 950 through 2150 MHz). The default setting is 2150 MHz.
- Step 3.** When the desired settings are displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current settings. A pop-up menu displays Save options.
- Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another frequency. If you are unsure about which frequencies to use, contact your dealer/reseller, or local service provider.

## ...About I/Q signal inversion

The I/Q Select function provides automatic or manual tracking of inverted and non-inverted digital QPSK signals. When set to Automatic, the I/Q Select function automatically tracks the received digital signal and inverts the signal, as required. When set to Inverted, the received digital signal is always inverted. Conversely, when set to Non-Inverted, the received digital signal is never inverted. The I/Q Select function is normally set to Automatic. The I/Q Select Inverted and Non-Inverted settings can be used to automatically reject unwanted signals.

### To set I/Q signal inversion...

- Step 1.** Move to **I/Q Select** and press SELECT to display available settings (Automatic, Inverted and Non-Inv). The default setting is Automatic.
- Step 2.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 3.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat the above action to change the I/Q Select setting. Unless otherwise recommended, I/Q Select should normally be set to Automatic (default). If you are unsure about which setting to use, contact your dealer/reseller, or local service provider. For a list of default receiver settings, see Table 7.

# Receiver Status menu

Information about the current receiver setup and about current receiver operating conditions is available from the Receiver Status menu, including ADP count. The current setup is also affected by your LNB antenna (dish) installation.

To display the Receiver Status menu...

Step 1. Display the Main Menu (Figure 7).

Step 2. Move to **Receiver Status** and press SELECT.

**Available options:** Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu. You can also select USER SETUP (or press 2 and then SELECT) to display the User Setup menu, or select RECEIVER SETUP (or press 3 and then SELECT) to display the Receiver Setup menu, or select CONFIGURATION (or press 4 and then SELECT) to display the Configuration menu.

You can view information about the current setup. Your dealer/reseller or local service provider can advise you about what receiver settings you may need to change. The following available satellite broadcast services information is displayed on-screen.

- ☐ Network ID
- ☐ Address
- ☐ Smart Card
- ☐ Signal Strength
- ☐ Signal Quality
- ☐ Signal State
- ☐ ADP (enc)
- ☐ ADP (non-enc)

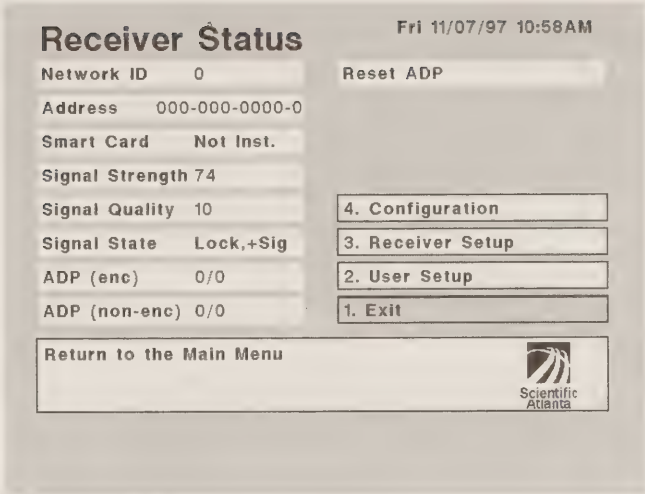


Figure13. Receiver Status menu display

## ...About the ADP count

The encrypted and non-encrypted Address Data Packet (ADP) count is continuously monitored by the receiver. The information displayed on-screen for each packet type indicates how much of the transmitted packet information is being accurately received and processed by the receiver. Under ideal conditions, both of the displayed figures are (nearly) identical. To assist with monitoring your receiver's performance, you can clear or reset the ADP count to zero (0) at any time using the Reset ADP option. The ADP count is also reset each time the receiver is switched ON.

To reset the ADP count...

Step 1. Move to **Reset ADP** and press SELECT.  
The ADP count is reset to zero (0).

Repeat the above actions to reset the ADP count.

### Network ID...

The Network ID display is the current Network ID. This number must be correctly set at the Receiver Setup menu to match the Network ID associated with the uplink signal. Loss of service will result if the receiver Network ID and/or Bouquet ID does not match the uplink signal Network/Bouquet ID information (see also "...About the Network ID").

### Address...

This is the address of your receiver and is provided by the internal security element (ISE) installed in the receiver. It distinguishes your receiver from all other receivers within the network.

### Smart Card...

The Smart Card display indicates whether the Smart Card external security device is installed or not installed (see Figure 5). If your receiver includes a Smart Card, the device OSE<sup>1</sup> version identification number is displayed at the Configuration menu if a Smart Card is used.

### Signal Strength...

The Signal Strength display is continuously updated to indicate the relative strength of the received QPSK digital signal. The Signal Strength (displayed on a scale from 00 through 99) is associated with the signal input level. Signal Strength is also displayed at the Receiver Setup menu, and graphically at the Dish Pointing menu (see also "...About Signal Strength and Signal Quality").

### Signal Quality...

The Signal Quality display is continuously updated to indicate the relative quality of the received QPSK digital signal. The Signal Quality (displayed on a scale from 0 through 9) is associated with the Bit Error Rate, and is a measure of how much of the original signal information is being received. Signal Quality is also displayed at the Receiver Setup menu, and graphically at the Dish Pointing menu (see also "...About Signal Strength and Signal Quality").

### Signal State...

The Signal State display is continuously updated to indicate that the receiver is synchronized with the received LNB signal (confirmed by the "*Lock, Sig*" status display), or to indicate loss of signal synchronization (confirmed by the "*Lock, No Sig*" status). If the receiver is able to synchronize to a carrier frequency only and no MPEG stream is present or is recognized, the "*Lock, No Sig*" status is displayed, and the Signal indicator LED is OFF. If no digital carrier signal is detected, the "*No Lock*" status is displayed, and the Signal indicator LED is also OFF. If a signal search activated using the "Find" option is in progress, the "*Searching*" status is displayed (see also "...About the Find option" and "Search Setup menu"). Signal State is also displayed at the Receiver Setup menu, and at the Dish Pointing menu (see also "...About the Signal State").

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<sup>1</sup> Outside Security Element



# Available Services menu

Information about available satellite broadcast services and the current setup is available from the Available Services menu. These services are authorized through your dealer/reseller or local service provider. The current setup is also affected by your LNB antenna (dish) installation.

To display the Available Services menu...

Step 1. Display the Main Menu (Figure 7).

Step 2. Move to Available Services and press SELECT.

**Available options:** Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu.

You can view information about the current setup. The following available satellite broadcast services information is displayed on-screen.

- ☐ Video (PID)<sup>1</sup>
- ☐ Audio (PID)
- ☐ LS Data<sup>2</sup> (PID)
- ☐ WB Data (PID)
- ☐ CONTROL (control pins status)
- ☐ VBI (PID)<sup>3</sup>
- ☐ Download (PID)
- ☐ Channel (current channel number)
- ☐ Encryption (status)
- ☐ Scrambling (status)
- ☐ Authorization (status)

<sup>1</sup> Packet ID  
<sup>2</sup> Low Speed Data  
<sup>3</sup> Vertical Blanking Interval

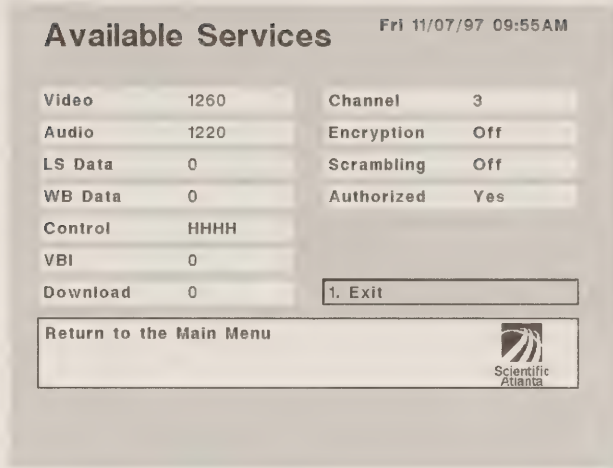


Figure14. Available Services menu display

## ...About subscriber services

Subscriber uplink services made available to your Business Satellite Receiver are associated with virtual channels. These channels can include video, audio and/or data services. All authorized virtual channel services are provided via PowerVu Command Center (PCC) system software and broadcast facility equipment, and are decoded by the receiver using the current receiver setup. You can view available subscriber services information independently (i.e., for each virtual channel) from the Available Services menu. If subscriber services are not authorized or are authorized for specific virtual channels only, an on-screen message is substituted for the virtual channel display, and the Authorized field displays “No” to indicate that no uplink service authorization key is being received. For more information about Wideband Data, see “Connecting your system”.

If EXPANSION PORT control pins are being used for remote receiver operation via Serial Remote Control commands, the status of each pin is displayed at the Control field. For example, if all four control pins are set to the open collector state (i.e., High), the Control field displays “HHHH”. For more information about the EXPANSION PORT, see “Connecting your system” (see also “Appendix C Serial Remote Control Command Set”).

For more information about screen messages, see “Appendix B Troubleshooting”.

## **...About the current channel**

When you navigate to menus from video, the information displayed is associated with the current (video) channel, which is also displayed on-screen at the Available Services menu. If no changes have been made to the current setup, you are automatically returned to the same channel when you exit to video. If any changes have been made (at the Receiver Setup menu only), exiting to video from menus after saving changes is always preceded by the installer channel banner display. Note that changes made at any other menu permit direct return to the previously-watched channel. For more information about the installer channel, see "Setting up the receiver".

# Dish Pointing menu

Information about the strength and quality of the incoming signal obtained via your satellite LNB antenna (dish) installation and current receiver setup is available from the Dish Pointing menu graph display.

To display the Dish Pointing menu...

**Step 1.** Display the **Main Menu** (see Figure 7).

**Step 2.** Move to **Dish Pointing** and press **SELECT**.

**Available options:** Move to Exit and press **SELECT** (or press 1 and then **SELECT**) to return to the previous menu.

You can view information about the current setup. Two independent bar graphs provide continuous display of Signal Strength and Signal Quality. Signal Strength and Signal Quality information is also displayed numerically at the Receiver Status and Receiver Setup menus (see “Receiver Status menu” and “Receiver Setup menu”).

## ...About Signal Strength and Signal Quality

Your Business Satellite Receiver actively monitors and updates the strength and quality characteristics of the incoming signal as it is decoded, and displays this information dynamically using two (2) bar graphs. The Signal Strength (displayed on a scale from 0 through 99) is associated with the Symbol Rate and signal input level. The Signal Quality (displayed on a scale from 0 through 9) is associated with the Bit Error Rate, and is a measure of how much of the original signal information is being received.

Certain receiver settings can cause signal loss or degradation which can compromise video or audio information, or data. The effect of any changes you make to your satellite LNB antenna installation is immediately displayed on the bar graphs. Signal Strength and Signal Quality can also be affected by changes at the signal source, and/or by adverse environmental or terrestrial conditions. Taken in combination, certain receiver settings and signal conditions can cause the Signal Strength and Signal Quality (values) to increase or decrease accordingly.

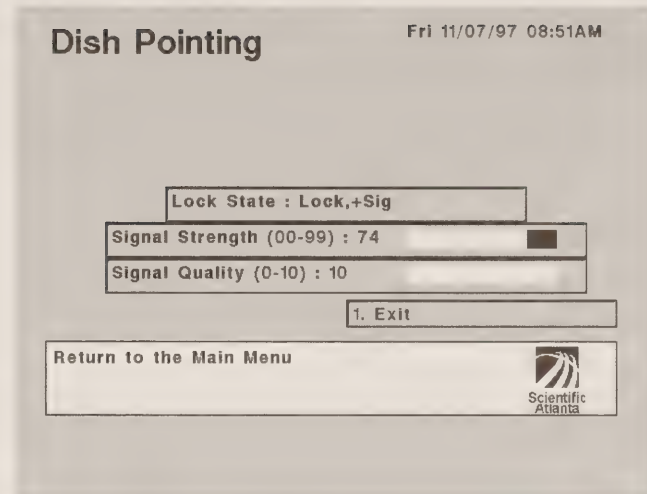


Figure15. Dish Pointing menu display

Temporary, solar-related electromagnetic disturbances occur every year during the spring and autumn months. These disturbances usually persist for several minutes a day for approximately one week during these periods. Your service provider will advise you about channels that may be adversely affected. For troubleshooting information, see “Appendix B Troubleshooting”.

To verify your satellite LNB antenna installation or improve signal reception, refer to your antenna equipment installation manual, or contact your dealer or service provider.

# Configuration menu

Information about the currently installed receiver operating software and hardware is available from the Configuration menu.

To display the Configuration menu...

**Step 1.** Display the Main Menu (Figure 7).

**Step 2.** Move to **Receiver Status** and press SELECT.

**Step 3.** Move to **Configuration** and press SELECT.

**Available options:** Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu.

You can view detailed information about the installed receiver software. The following receiver configuration information is displayed.

- ☐ BSR App
- ☐ Download
- ☐ Boot
- ☐ IOP
- ☐ ISE
- ☐ OSE

## Application software version...

The BSR App display identifies the version number of the receiver application software. Receiver application software can be upgraded locally via Remote Control Commands (via the EXPANSION PORT), or remotely (i.e., over-the-air) via PowerVu System software control.

## Configuration

Fri 11/07/97 10:10AM

App 2.10

Download 1.02

Boot 3.04

IOP 1.90

ISE 1.05

OSE N/A

1. Exit

Return to the Receiver Status menu



Figure16. Configuration menu display

## Download software version...

The Download display identifies the version number of the receiver Download software. Remote receiver application software downloads performed over-the-air via PowerVu System software are executed using the Download software.

## Boot software version...

The Boot display identifies the version number of the receiver Boot (or startup) software. The Boot software is executed each time the receiver is restarted.

## IOP software version...

The IOP display identifies the version number of the receiver IOP (Input/Output Processor) software. The IOP software controls the operation of all front panel buttons and menu (softkey) functions.



### **ISE software version...**

The ISE display identifies the version number of the receiver ISE (Internal Security Element) software. The ISE software controls the operation of all internal data security functions.

### **OSE software version...**

The OSE display identifies the version number of the receiver OSE (Outside Security Element) software, if installed. The OSE software operates on an external Smart Card<sup>1</sup> device.

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<sup>1</sup> Smart Card operation is currently unavailable

# Network Presets menu

This menu lets you configure and store sets of network parameters to be used to define as many as 24 network signals. Each configuration set is called a “preset” and is uniquely identified by a preset number (0 to 23). Once you have configured and stored your presets, you can quickly choose which network signal you want to lock on to by using the Remote Control unit.

If you have only one network preset to configure, you could use the Receiver Setup menu instead of this menu. (See also “Receiver Setup menu”.) However, to configure two or more network presets, you must use the Network Presets menu.

Most of the functions needed to set up your Business Satellite Receiver are available from the Network Presets menu. You can view or change the current setup.

## To display the Network Presets menu...

- Step 1.** Display the **Main Menu** (see Figure 7).
- Step 2.** Move to **Receiver Status** and press SELECT.
- Step 3.** Move to **User Setup** and press SELECT.
- Step 4.** Move to **Network Presets** and press SELECT.

**Available options:** Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu.

## ...General rules for using the Network Presets menu

- ☐ The settings in fields Freq Mode, L.O. Freq #1, L.O. Freq #2, and Crossover can be changed only at the Receiver Setup menu. These settings are used for all network presets. If you set L.O. Freq #1 to a value less than 8 GHz, it is used as a C-Band L.O. frequency for all network presets. If you set L.O. Freq #1 to a value greater than 8 GHz, it is used as a low Ku-Band L.O. frequency for all network presets
- ☐ If you use Ku-Band, you must define L.O. Freq #1, L.O. Freq #2, and Crossover (at the Receiver Setup menu).

## Network Presets

Fri 11/07/97 10:27 AM

<b>Freq Mode</b>	<b>Downlink</b>	<b>Network ID</b>	1
<b>Frequency</b>	1050.00	<b>AFC Level</b>	+01
<b>L.O. Freq #1</b>	10.750	<b>Signal Strength</b>	74
<b>L.O. Freq #2</b>	N/A	<b>Signal Quality</b>	10
<b>Crossover</b>	N/A	<b>Signal State</b>	Lock,+Sig
<b>Polarization</b>	H	<b>Use NIT</b>	Yes
<b>FEC Rate</b>	3/4	<b>Preset Number</b>	0
<b>Symbol Rate</b>	14.3000	1. Exit	

Return to the Receiver Status menu

Band: Low Ku



Figure17. Network Presets menu display

- ☐ If your LNB has only one local oscillator, set both L.O.s to the same local oscillator frequency.
- ☐ Whenever you change a setting that is common to both the Receiver Setup menu and the Network Presets menu, the setting is changed accordingly in both menus.
- ☐ The current band you are using at the Network Presets menu depends on the frequency defined. Any frequency between 0 and 8 GHz is C-Band. Otherwise, the frequency is KU-band.
- ☐ When you switch between presets, the frequency mode in the Receiver Setup menu changes to downlink.
- ☐ For those familiar with L-Band frequencies, the Downlink frequency can be determined according to the following formula:

$$\text{Downlink freq.} = \text{L-Band freq.} + \text{L.O. freq.}$$

## To set the Local Oscillator and Crossover frequencies...

- Step 1.** Go to the Receiver Setup menu.
- Step 2.** Set field Freq Mode to Downlink.

**Step 3.** If you want to use C-Band, set L.O. Freq #1 to the desired C-Band frequency (0 to 8 GHz) at the Receiver Setup menu, and then save the setting. All network presets with downlink frequencies ranging from 0 to 8 GHz will use the L.O. frequency defined in this step.

**Step 4.** If you want to use Ku-Band and if your LNB has two local oscillators set L.O. Freq #1, L.O. Freq #2, and Crossover for Ku-Band, and then save the settings.

If you want to use Ku-Band and if your LNB has only one local oscillator set both L.O. Freq #1 and L.O. Freq #2 to the same setting as is applicable to your LNB.


All network presets with downlink frequencies greater than 8 GHz will use the L.O. frequencies defined in this step.

**Step 5.** Go back to the Network Presets menu to configure the rest of the settings.

### To set the operating Frequency...

**Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.

**Step 2.** Move to **Frequency** and press SELECT to replace the current setting.

**Step 3.** Enter a valid frequency and then press SELECT. You can also press the  arrow buttons to display available settings from 0 GHz through 15 GHz (Downlink) in 250 kHz steps. The default setting for Downlink is 10.7 GHz.

**Step 4.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 5.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another frequency. A valid operating Frequency is always required (i.e., for setting the Downlink frequency).

### To set the antenna LNB polarization...

**Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.

**Step 2.** Move to **Polarization** and press SELECT to display available settings (H [Horizontal], H (Fixed), V [Vertical]) or V (Fixed). The default setting is H (Horizontal).

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the polarization. When a Horizontal polarization is set, a 19 volt DC signal is output via the receiver rear panel SATELLITE connector. When a Vertical polarization is set, a 13 volt DC signal is output via this connector. Observe the effect of the polarization change by checking the displayed relative Signal Strength and Signal Quality values (see Figure 9). Higher numbers are better. If you are unsure about which polarization to use, contact your dealer/reseller, or local service provider.

### To set the FEC rate...

**Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.

**Step 2.** Move to **FEC Rate** and press SELECT to display available settings (1/2, 2/3, 3/4, 5/6, or 7/8). The default setting is 7/8.

**Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the FEC Rate. The selected FEC Rate must match the FEC Rate associated with the transmitted signal. If you are unsure about which FEC rate to use, contact your dealer/reseller, or local service provider.

#### To set the Symbol Rate...

- Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.
- Step 2.** Move to **Symbol Rate** and press SELECT to replace the current setting.
- Step 3.** Enter a valid Symbol Rate using the numbered Remote Control buttons and then press SELECT. You can also press the **↑/↓** arrow buttons to display available settings (Symbol Rates are displayed from 3 MS/s through 30.8000 MS/s in 10 KS/s steps). The default setting is 28.3465 MS/s.
- Step 4.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 5.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change to another Symbol Rate. The selected Symbol Rate must match the Symbol Rate associated with the transmitted signal. If you are unsure about which Symbol Rate to use, contact your dealer/reseller, or local service provider.

#### To set the Network ID...

- Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.
- Step 2.** Enter a valid Network ID (number) and then press SELECT. You can also press the **↑/↓** arrow buttons to display available settings (numbers are displayed from 0 through 65535).
- Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.

**Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

Repeat this action to change the Network ID (see also "...About the Network ID"). Changing the Network ID is normally required only when authorized subscriber services are changed, or when new or different subscriber services are made available (see Figure 9). If you are unsure about which Network ID to use, contact your dealer/reseller, or local service provider. Changing the Network ID may also require that you execute a signal search (see "Search Setup menu" and "...About the Find option").

#### To set the NIT...

- Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.
- Step 2.** Move to **Use NIT** and press SELECT to switch between YES and NO.
- Step 3.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT to change the current setting. A pop-up menu displays Save options.
- Step 4.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

#### To set or change the Preset Number...

- Step 1.** Be sure you have configured the Local Oscillator and Crossover frequencies as described above.
- Step 2.** Move to **Preset Number** and press SELECT to clear the current setting.
- Step 3.** Enter a valid Preset Number (0 to 23) and then press SELECT. You can also press the **↑/↓** arrow buttons to cycle through the valid range.
- Step 4.** When the desired setting is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT. A pop-up menu displays Save options.



**Step 5.** Press 1 to save the new setting (YES), or follow the on-screen instructions, as required.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

## ...How to select a Network Preset

Once you have configured the Network Presets you want, you can easily select a preset while the receiver is in video mode by using the Remote Control unit.

*To select a Network Preset while viewing video...*

Note: You must perform the following step within a two second duration.

**Step 1.** On the Remote Control unit, press FAVORITE (the current Network Preset is displayed), key in the number of the configured Network Preset you want, and press SELECT.



**IMPORTANT!** It takes several seconds for the newly selected Network Preset to be displayed on screen.

## ...About the Signal State

During normal operation, your receiver is synchronized with the received LNB signal (confirmed by the "Lock, Sig" status display). If the receiver is able to synchronize to a carrier frequency only and no MPEG stream is present or is recognized, the "Lock, No Sig" status is displayed, and the Signal indicator LED is OFF. If no digital carrier signal is detected, the "No Lock" status is displayed, and the Signal indicator LED is also OFF.

# Display Setup menu

This menu lets you select (a) the colour to be used for the menu background, (b) the colour to be used for the subtitling text and (c) the colour to be used for the subtitling shade (background),

## Menu background...

Menu background refers to the area over which menu fields are placed. Once you have selected a menu background colour, it is applied to all menu screens.

## Subtitling text...

Subtitling text is displayed on the lower portion of the video screen, if the option is enabled. The text will be displayed in the language selected in the User Setup menu.

## Subtitling shade (background)...

Subtitling shade refers to the area which is superimposed over the lower portion of the video to serve as a background for subtitling text.

### To display the Display Setup menu...

**Step 1.** Display the **Main Menu** (see Figure 7).

**Step 2.** Move to **Receiver Status** and press SELECT.

**Step 3.** Move to **User Setup** and press SELECT.

**Step 4.** Move to **Display Setup** and press SELECT.

**Available options:** Move to Exit and press SELECT (or press 1 and then SELECT) to return to the previous menu.

# Display Setup

Fri 11/07/97 10:18AM


Subtitle shade	Opaque	Menu colour	Green
Subtitle Col.	Auto	1. Exit	
Return to the Receiver Setup menu			

Figure18. Display Setup menu display

### To change the menu background colour...

**Step 1.** Move to Menu colour and press SELECT to replace the current colour.

**Step 2.** When the desired colour is displayed on-screen, move to Exit and press SELECT, or press 1 and then press SELECT.  
A pop-up menu displays Save options.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

### To change the subtitling colour...

**Step 1.** Move to Subtitle col. and press SELECT to replace the current setting. (If you choose AUTO, the colour used will be automatically chosen at the uplink.)

**Step 2.** When the desired setting is displayed in the field, move to Exit and press SELECT, or press 1 and then press SELECT.  
A pop-up menu displays Save options.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

**To change the subtitling shade (background) colour...**

**Step 1.** Move to Subtitle shade and press SELECT to replace the current setting. (See Table 9 for descriptions of settings.)

**Step 2.** When the desired setting is displayed in the field, move to Exit and press SELECT, or press 1 and then press SELECT.  
A pop-up menu displays Save options.

**Available options:** Press 1 to save the new settings (Yes), or press 2 to discard all changes (No), or press 3 to cancel the operation (Cancel).

**Table9. Available Subtitling shade options**

Option	Description
Auto	Subtitling background will be chosen automatically at the uplink.
None	No background used. Subtitling text will be displayed directly on top of video.
Semi-trans	Subtitling background will partially obscure the video.
Opaque	Subtitling background will totally obscure the video.
Shadow	A drop shadow will be applied to the subtitling text. No other subtitling background will be used.





# Appendix A Specifications

This Appendix provides important information about your PowerVu Business Satellite Receiver. Refer to this section for:

- ❑ Product features and specifications

The accompanying table lists standard features, available options and specifications information.

Table10. Product specifications

Standard Features	Description
MPEG 2 video decompression:	YES
MPEG Musicam audio:	YES
Wide aspect ratio video:	YES
Variable symbol rate:	YES
Front panel control:	YES
Remote Control :	YES
S-Video output:	YES
Low-speed utility data:	YES
VBI reinsertion:	YES
NTSC or PAL:	YES
General Specifications	Description
Weight:	Approximately 11.5 lbs. (5.22 kg)
Dimensions:	2.5 inches H X 14.0 inches W X 10.5 inches (6.4 cm H X 35.6 cm W X 25.4 cm D)
Operating temperature:	32° F to 104° F (0° C to 40° C)
Storage temperature:	-40° F to 140° F (-40° C to 60° C)
Relative humidity:	5% to 95%, non-condensing
Operating Specifications	Description
AC power requirements:	Voltage range (90 VAC to 264 VAC), Line frequency: (47 Hz to 63 Hz)
Power consumption:	35W
Modulation:	QPSK
TV modulator:	NTSC ([VHF] standard) or PAL ([UHF] optional)
TV modulator: video output level:	NTSC or PAL (66 dBu [typical])

<b>Operating Specifications (cont'd)</b>	<b>Description</b>
Video output level:	1.0 V p-p $\pm 10\%$
Audio output level:	2V RMS @ 10 K (max.)
Video Signal-To-Noise-Ratio:	$\geq 56$ dB
Maximum video resolution :	704 x 576
Aspect Ratio	4X3 and 16X9 transmission compatible (where available, and enabled at PCC system uplink)
VBI reinsertion:	WST and NABTS
RF video signal input level:	-30 dBm through -60 dBm per carrier
L-Band Frequency range:	950 MHz through 2150 MHz
Frequency response:	Up to 5 MHz
Variable symbol rate:	3.0 through 30.8 MSymbols/s
Viterbi (inner) FEC:	1/2, 2/3, 3/4, 5/6 or 7/8
Viterbi (outer) FEC:	Reed Solomon, T=8
VBI insertion:	NTSC (VBI lines 10 through 22) or PAL (VBI lines 7 through 22)
<b>Input/Output Connectors and Controls</b>	<b>Description</b>
RF IN:	F type
ANT IN:	F type or IEC type
TV OUT (NTSC) or UHF OUT (PAL):	F type or IEC type
TV Modulator channel selector	CH3/CH4 (NTSC US), CH1/CH2 (NTSC Japan) rotary dial CH 30-39 (PAL G/I) switch
TSG (Test Signal Generator) ON/OFF	TSG slide switch (PAL models only)
PAL G/I standard selector	PAL G/I slide switch (PAL models only)
VIDEO (out):	RCA type
S-VIDEO (out):	4-pin mini-DIN
AUDIO, L & R, unbalanced (out):	2 (RCA type)
EXPANSION PORT:	25-pin D, female (Low-Speed Utility Data)
WIDEBAND DATA port	9-pin D, female (Wideband Broadcast Data)
LNB PWR (drive voltage) ON/OFF:	13/19 VDC @ 250 mA max. (15 VDC @ 250 mA max. - optional [Japan only])

# Appendix B Troubleshooting

This Appendix provides important information about your PowerVu Business Satellite Receiver. Refer to this section for:

- ❑ Product troubleshooting checklist
- ❑ Commonly-asked questions with answers

## Troubleshooting checklist

If you experience any problems operating your Business Satellite Receiver, the following troubleshooting guide may help you to resolve your problem. Loose (or intermittent) cable connections or an incorrect receiver setting can cause loss of service, signal degradation, sound or picture problems. In most cases, these problems can be quickly resolved by following the tips and suggestions provided in the Troubleshooting checklist. Also included is a list of answers to some commonly asked questions.

Note that temporary, solar-related electromagnetic disturbances occur every year during the spring and autumn months. These disturbances usually persist for several minutes a day for approximately one week during this period. When they occur, your service provider will advise you about certain channels that may be adversely affected. If you are unable to resolve your problem after consulting this Troubleshooting checklist, contact your dealer/reseller or local service provider for assistance, or contact your local Scientific-Atlanta Customer Support Center.

Table11. Troubleshooting checklist

Problem	Possible Causes	Remedies
1. Blank screen (TV switched on)	<ul style="list-style-type: none"><li>• Normal operation if BSR is not switched on</li></ul>	<ul style="list-style-type: none"><li>• Press the ON/STANDBY button on the receiver front panel, or press the POWER key on your Remote Control transmitter</li></ul>
2. Incomplete or interrupted video recording	<ul style="list-style-type: none"><li>• BSR manually switched off during VCR recording</li></ul>	<ul style="list-style-type: none"><li>• Do not switch the BSR off during a recording session</li></ul>
3. Scrambled channel (not decoded)	<ul style="list-style-type: none"><li>• Your subscriber services may not be authorized for the channel</li></ul>	<ul style="list-style-type: none"><li>• Check that your subscriber services are currently authorized (contact your local services provider)</li></ul>
4. Cannot access a password protected on-screen option	<ul style="list-style-type: none"><li>• You have not entered the correct password, or the password may be changed</li></ul>	<ul style="list-style-type: none"><li>• Check that you are using the correct password (if you've lost the password, or the password is unavailable, contact your dealer/reseller or local service provider for assistance)</li></ul>
5. Cannot record a program on your VCR	<ul style="list-style-type: none"><li>• Your VCR is not properly connected (see "Connecting your system")</li><li>• You have attempted to record a copy-protected program or event (some programs are copy-protected at the discretion of the copy-right owner and may not record properly on your VCR)</li></ul>	<ul style="list-style-type: none"><li>• Check that your VCR is properly connected</li><li>• For information about Macrovision copy-protected programs or events, contact your dealer/reseller or local service provider</li></ul>
6. Remote Control transmitter not operating properly	<ul style="list-style-type: none"><li>• You have not pressed the correct Remote Control button</li><li>• The Remote Control may be defective, or the batteries are incorrectly installed, or are exhausted and require replacement</li></ul>	<ul style="list-style-type: none"><li>• Check that you are pressing the correct Remote Control button</li><li>• Replace or correctly install the Remote Control batteries (see "Installing the Remote Control batteries" for details)</li></ul>

Problem	Possible Causes	Remedies
7. No signal present (BSR switched on) and/or No SIGNAL message displays	<ul style="list-style-type: none"> <li>• Installation problem</li> <li>• Signal problem</li> <li>• Local heavy precipitation falling (normal operation will likely resume after the precipitation has stopped)</li> <li>• Subscriber services are not authorized</li> <li>• You have attempted to record a copy-protected program (some programs are copy-protected at the discretion of the copyright owner and cannot be recorded properly on your VCR)</li> </ul>	<ul style="list-style-type: none"> <li>• Check that all satellite/antenna/video and other cables are properly connected</li> <li>• Check that your satellite antenna (dish) is properly aligned</li> <li>• Check that the correct BSR installation settings are being used, that an adequate signal level is present and that receiver operating status being reported</li> <li>• Check that the video signal is being routed directly from the BSR, and not via your VCR equipment (some programming may be transmitted using Macrovision copy protection –for information about Macrovision copy-protected programs or events, contact your dealer/reseller or local service provider)</li> <li>• Check that the TV modulator selector switch (receiver rear panel) is set to the correct channel for receiving satellite signals via your TV tuner/converter</li> <li>• Check that your subscriber services are currently authorized</li> </ul>
8. PROGRAM NOT AUTHORIZED message displays	<ul style="list-style-type: none"> <li>• Subscriber services are not authorized for the selected channel</li> </ul>	<ul style="list-style-type: none"> <li>• Check that your subscriber services are currently authorized by displaying signal status information at the Available Services menu (see "Available Services menu" and/or contact your local services provider)</li> </ul>
9. AUTHORIZATION KEY NOT RECEIVED message displays	<ul style="list-style-type: none"> <li>• Subscriber services are not authorized due to authorization key not being received</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> </ul>
10. BLACKOUT message displays	<ul style="list-style-type: none"> <li>• Subscriber services are not authorized because of local blackout</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> </ul>
11. Blank (black) screen displays after exiting to video from menus	<ul style="list-style-type: none"> <li>• Installer channel screen displayed after exiting to video following changes made to the current receiver setup</li> </ul>	<ul style="list-style-type: none"> <li>• Press the CH ↑ or CH ↓ button on your Remote Control to display virtual channels</li> </ul>
12. Poor reception	<ul style="list-style-type: none"> <li>• Your antenna, video and/or audio cables may be faulty or not properly connected</li> <li>• Your Business Satellite Receiver is not setup to properly receive the satellite signal</li> <li>• Possible station trouble (the signal source for one or more channels (or all channels) is temporarily affected by technical transmission problems or a temporary solar disturbance)</li> <li>• Your satellite antenna (dish) may not be properly installed (dish/LNB alignment) or is not accurately aimed at the satellite signal transmission source</li> </ul>	<ul style="list-style-type: none"> <li>• Check the connections to and from the satellite antenna LNB, television antenna, and all video and audio cables (see "Connecting your system" for details)</li> <li>• A transmission problem or a temporary solar disturbance may be causing the poor reception (contact your service provider)</li> <li>• Check another channel or channels to compare signal reception</li> </ul>
13. No picture, no sound	<ul style="list-style-type: none"> <li>• You have not turned your Business Satellite Receiver on or the receiver is not properly connected to AC power</li> <li>• Your antenna, video and/or audio cables may be faulty or not properly connected</li> <li>• Possible station trouble (the signal source for one or more channels</li> </ul>	<ul style="list-style-type: none"> <li>• Press the ON/STANDBY button on the receiver front panel, or press the POWER key on your Remote Control transmitter</li> <li>• Check that your Business Satellite Receiver is properly connected to AC/power</li> <li>• Check the connections to and from the satellite antenna LNB, televi-</li> </ul>



Problem	Possible Causes	Remedies
	(or all channels) is temporarily affected by transmission problems or due to a temporary solar disturbance	<p>sion antenna, and all video and audio cables (see "Connecting your system" for details)</p> <ul style="list-style-type: none"> <li>• Check another channel or channels to compare signal reception</li> </ul>
14. Picture OK, poor sound	<ul style="list-style-type: none"> <li>• You have muted the sound</li> </ul>	<ul style="list-style-type: none"> <li>• Check that the volume setting is not muted by pressing the VOL ↑ or VOL ↓ button on your Remote Control</li> <li>• Check another channel or channels to compare signal reception</li> <li>• See the previous item in this table for details</li> </ul>
15. Sound OK, poor picture		<ul style="list-style-type: none"> <li>• Check another channel or channels to compare signal reception</li> <li>• See the previous item in this table for details</li> </ul>

# Questions and answers

The following list of commonly-asked questions with answers may answer some questions or concerns you have about the operation of your Business Satellite Receiver.

Questions	Answers
1. What happens if the BSR is unplugged, or disconnected from AC power?	1. Your BSR may be deauthorized if not in use for an extended period of time. If this happens, contact your dealer/reseller or local service provider to reauthorize your satellite services.
2. If the system does not appear to be working properly, what can be done?	2. Follow the troubleshooting tips and suggestions provided in this guide. If the problem persists, contact your dealer/reseller or local service provider.
3. Why must the TV monitor be tuned to a specific channel (RF modulator)?	3. Your Business Satellite Receiver provides a television signal to your TV tuner over a frequency that corresponds to specific channels, depending on which model you have (channel s 1 or 2 for NTSC [Japan] standard, channels 3 or 4 for NTSC [M/US] standard or channels 28 through 47 for PAL standard). Your dealer/reseller or local service provider can identify the correct TV tuner and rear panel switch setting(s) to use.
4. Can other programming be received using the same satellite antenna (dish)?	4. An antenna signal distribution system that includes a signal splitting or bypass feature lets you distribute or receive other satellite signals. To find out if your system includes this capability, contact your antenna installer, or your dealer/reseller or local service provider.
5. If there is more than one TV monitor available, can the Business Satellite Receiver be used to watch different channels on each TV monitor?	5. No. To do this requires a separate BSR for each TV monitor.
6. How do you know which broadcast subscriber services you are authorized to receive?	6. If you are not authorized to receive broadcast services for (a) channel(s), program(s) or event(s)), or if authorized services are temporarily interrupted or changed, an on-screen message is displayed (see "Troubleshooting checklist" on the previous page). For more information, contact your dealer/reseller or local service provider.

# Appendix C Serial Remote Control Command Set

This Appendix provides important information about your PowerVu Business Satellite Receiver. Refer to this section for:

- BSR Remote Control command details

Your Business Satellite Receiver is equipped for external remote operation and control using serial Remote Control commands via a PC/workstation or data terminal connection. This optional connection can be made at the receiver rear panel serial data port labeled EXPANSION PORT (see “Connecting your system”). Remote operating commands can be used in place of the user interface for remote receiver setup and monitoring.

General information about how remote commands are used is followed by detailed information about each command, including syntax and command options.

## Command protocol

Each of the serial Remote Control commands are executed using a unique protocol or rules. These rules control command syntax (i.e., how a command must be sent to the receiver) and how the receiver responds. Commands can only be interpreted by the receiver if upper case characters are used. When sending commands, observe the following.

- Use only upper case ASCII characters
- All serial Remote Control commands begin with the characters “SA1”
- A command is executed only after a carriage return character is sent (i.e., the Enter or Return key is pressed)

The following conventions are used for identifying the serial Remote Control command options found in this Appendix.

- Left and right parenthesis characters “{ }” and the forward slash character “/” are used to separate the command option(s) from the main command characters, and must not be entered
- The forward slash character “/” used to separate command options indicates that one of the available options must be specified, and must not be entered

The following example shows correct command usage.

## SA1VER<CR>

In the above example, the VER command causes the receiver model number to display only after the Enter key is pressed (i.e., carriage return [<CR>]). The command is valid only if the characters “VER” are used (i.e., “VER” is not a valid command, even though the characters are the same). If command or syntax is invalid, the receiver responds with “?”. If an internal overflow condition exists when executing a command, the receiver responds with “V”. Note that all serial Remote Control commands begin with the characters “SA1”.

## Command/Response messaging

A specific protocol is used for constructing and processing all Remote Control command and resulting response messages. The accompanying table shows BSR command frame and response frame information.

Table12. BSR Command/Response frames

Command frame			
Byte	Length	Data	Description
1	1	"S"	Start character #1
2	1	"A"	Start character #2
3	1	"1-9"	Unit Number (In chain) <sup>1</sup>
		":"	Precedes next ASCII character (if more than 9 units in chain)
4	n		Command code and parameters
4 + n	1	<CR> <sup>2</sup>	End of message
Response frame			
1	1	<LF> <sup>3</sup>	Line Feed
2	n		Command Response
2 + n	1	<CR>	Carriage Return
3 + n	1	<LF>	Line Feed
4 + n	1	">"	Ready for next message

<sup>1</sup> Decoder is addressed when first unit (1) received

<sup>2</sup> Carriage Return

<sup>3</sup> Line Feed

All transmitted command characters must be upper case ASCII. All characters are echoed by the receiver, except for the Unit Number (i.e., byte #3) which is decremented if greater than zero (0). This permits daisy-chaining two or more receivers from one serial port.

## Error responses

The accompanying table shows BSR command error and overrun error response frame information.

Table13. Command/Overrun errors

Command error frame			
Byte	Length	Data	Description
2	1	"?"	Command error response
Overrun error frame			
2	1	"&"	Overrun error response

?

The command error message displays if the receiver cannot recognize the command, or if an internal microprocessor operating error or error condition exists.

&

The overrun error message displays if the receiver cannot process the command completely, and/or if the command becomes corrupted during transmission.

## Bit Error Rate (BER)

The BER command is available for polling the receiver to display the current Bit Error Rate of the decoded digital signal (errors per second). Observe the following syntax.

### SA1BER

BER polls the receiver for the current Bit Error Rate (digital signal), where **##E-#** is the number is bit errors in a 1 million bit sample, expressed in scientific notation. The receiver responds by displaying the following.

BER=##E-#

## Channel

The Channel command is available for polling the receiver to display the current channel, or for changing the channel. Observe the following syntax.

### SA1CH=###

CH polls the receiver for the current channel. **CH=###** changes the current channel. The receiver responds by displaying the following.

CH=###

### can be any virtual channel number from 0 through 500.

## Errors (Corrected)

The CE command is available for polling the receiver to display the current Corrected Error count, and for clearing or resetting the Corrected Error count. Observe the following syntax.

### SA1CE=0

CE polls the receiver for the current Corrected Error count. **CE=0** clears or resets the current Corrected Error count. The receiver responds by displaying the following.

CE=###

### (0 through 65536) is the number of Corrected (Viterbi) Errors counted since the last reset. The Corrected Error count depends on the Signal Quality, and is automatically reset each time the receiver is restarted. For information about signal quality, see "Dish Pointing menu".



## Errors (Uncorrected)

The UE command is available for polling the receiver to display the current Uncorrected Error count, and for clearing or resetting the current Uncorrected Error count. Observe the following syntax.

UE=0

UE polls the receiver for the current Uncorrected Error count. UE=0 clears or resets the current Uncorrected Error count. The receiver responds by displaying the following.

UE=###

### can be any number from 0 through 65536, and is the number of uncorrected Viterbi errors counted since the last reset. The Uncorrected Error count depends on the Signal Quality, and is automatically reset each time the receiver is restarted. For information about signal quality, see "Dish Pointing menu".

## External Security microprocessor

The OSE command is available for polling the receiver to display the network address plus the installed software version for the External Security microprocessor (Smart Card), including algorithm information. Observe the following syntax.

OSE

OSE polls the receiver for network address and installed software version information (External Security microprocessor and algorithm [Smart Card]). The receiver responds by displaying the following

OSE=###-###-####-#, V#.#(##)-

###-###-####-# is the network address, V#.# is the software version, (##) is the decryption algorithm type, and "-" is displayed only if the Smart Card is not installed.

## Frequency Stability (AFC level)

The AFC command is available for polling the receiver to display the current relative offset from the set center frequency of the decoded digital signal. Observe the following syntax.

SA1AFC

AFC polls the receiver for the current relative offset from the set center frequency (decoded digital signal), where ## can be any number from -99 through +99. The receiver responds by displaying the following.

AFC={+/-}##

The receiver automatically compensates for a +/- 2.5 MHz frequency offset which is equivalent to an AFC value of approximately +/- 12.

## Installer

The INST command is available for displaying current receiver settings, or for changing the receiver settings. Observe the following syntax.

SA1INST=#,{###.#####/#####.##},#,,###.#####, ##.####, ##.####,  
##.####, #, #####, #####

INST polls the receiver for the current receiver settings. To change any setting, you must use all INST command options. The receiver responds by displaying the following.

INST=#,{###.#####/#####.##},#,,###.#####, ##.####, ##.####, ##.####, #, #####, #####

The accompanying table identifies each of the command parameters as displayed (from left to right), in order.

Table 14. INST command options

Parameter	Options
1. # (Frequency Mode)	0 (Downlink), 1 (L-Band 1), or 2 (L-Band 2).
2. #### (Downlink Frequency, if Frequency Mode set to Downlink) or #### (L-Band frequency, if Frequency Mode set to L-Band)	Range (0-15 GHz)  Range (950-2150 MHz, with 250 kHz resolution)
3. # (FEC Rate)	1 (1/2), 2 (2/3), 3 (3/4), 4 (5/6) or 5 (7/8)
4. #### (Symbol Rate)	Range (3-30.8 MS/s [variable-rate decoders only]) ignored in fixed-rate decoders
5. #### (Local Oscillator #1 frequency [C-Band])	Range (0-15 GHz)
6. #### (Local Oscillator #2 frequency [Low Ku-Band])	Range (0-15 GHz)
7. #### (Crossover frequency)	Range (10.7-15.0 GHz) for Dual-Ku [Downlink Mode] only)
8. # (Polarization)	0 (Horizontal), 1 (Horizontal, Fixed), 2 (Vertical) or 3 (Vertical, Fixed)
9. #### (Network ID)	0 to 65535
10. #### (Bouquet ID)	0 to 65535

When using the INST command, a valid Downlink frequency or L-Band frequency must be specified. The INST command is valid only if Channel 0 is the current channel, and if any menu (except the Receiver Setup menu) is displayed. For more information about the current channel, see "Available Services menu". No parameters may be omitted when using this command.

## Internal Security microprocessor

The ISE command is available for polling the receiver to display the network address plus the installed software version for the Internal Security microprocessor, including algorithm information. Observe the following syntax.

### ISE

ISE polls the receiver for network address and installed software version information (Internal Security microprocessor and algorithm), where ####-####-####-# is the network address, V### is the software version, (#) is the decryption algorithm type, and "-" is displayed only if the ISE is not installed. The receiver responds by displaying the following

ISE=####-####-####-#, V###(##) -

####-####-####-# is the network address, V### is the software version and (##) is the decryption algorithm type, and "-" is displayed only if the ISE is not installed.

## Keyboard microprocessor

The KBD command is available for polling the receiver to display the installed software version for the Keyboard microprocessor. Observe the following syntax.

### KBD

KBD polls the receiver for installed software version information (Keyboard microprocessor). The receiver responds by displaying the following.

KBD=V###

V### is the installed software version.

## Lock Level

The LOCK command is available for polling the receiver to display the current Lock Level setting, and for changing the Lock Level setting. Observe the following syntax.

SA1LOCK=#

LOCK polls the receiver for the current Lock Level setting. LOCK=# changes the receiver Lock Level. The receiver responds by displaying the following.

LOCK=#

# can be 0, 1, 2, 3 or 4. When set to 0, receiver lockout is disabled (all options are available). When set to 1, menus and current receiver settings are displayed, and all options are available except Factory Reset and Set Password. When set to 2, menus and current receiver settings are displayed, and all receiver functions are locked out or disabled except for all Receiver Setup and User Setup<sup>1</sup> menu options. When set to 3, menus are not displayed and all user interface receiver functions are locked out or disabled. Access to menus is Password-protected when Lock Level 3 is set. When set to 4, no menus are displayed and all receiver functions are locked out or disabled (i.e., accessible via remote terminal or PCC uplink signal only).

The Lock Level setting has no affect on serial Remote Control command operation in any way.

## Main microprocessor

The ICP command is available for polling the receiver to display the installed software version for the Main microprocessor. Observe the following syntax.

**SA1ICP**

**ICP** polls the receiver for installed software version information (Main microprocessor). The receiver responds by displaying the following.

ICP=V#.#

V#.# is the installed software version.

## Port Control

The PCTL command is available for polling the receiver to display the current operating state of EXPANSION PORT control pins, and for enabling or disabling external control over EXPANSION PORT control pins. Observe the following syntax.

**SA1PCTL,#={H/L/R}**

**PCTL,#** polls the receiver for the current state of (specific) EXPANSION PORT control pins, where # can be 1, 2, 3 or 4. **PCTL,#=H** sets the specified port pin for local control over the HIGH state (open collector) , where # can be 1, 2, 3 or 4. **PCTL,#=L** sets the specified port pin for local control over the LOW state (grounded) , where # can be 1, 2, 3 or 4. **PCTL,#=R** sets the specified port pin for REMOTE (uplink) control over the HIGH and LOW states, where # can be 1, 2, 3 or 4. The receiver responds by displaying the following.

PCTL,#={H/L/R}

# can be any pin (number) from 1 through 4. For more information about the EXPANSION PORT, see “Connecting your system”.

## Power

The PW command is available for polling the receiver for the current operating (power) state, or for powering the receiver on and off. Observe the following syntax.

**SA1PW={ON/OFF}**

**PW** polls the receiver for the current operating state. **PW=ON** powers the receiver on, and **PW=OFF** powers the receiver off. The receiver responds by displaying the following.

PW={ON/OFF}

The receiver is in standby mode when powered OFF.

## Reset

The RESET command is available for resetting (restarting) the receiver (i.e., main microprocessor) hardware. Observe the following syntax.

---

<sup>1</sup> Baud Rate and TV Audio options are unlocked

**SAIRESET=YES**

**RESET=YES** resets the receiver (i.e., warm boot only). The receiver responds by displaying the following.

**RESET=RECV**

Note that the **RESET** command *does not* reset the receiver operating software, or restore factory default receiver settings.

## Signal Quality

The **QLTY** command is available for polling the receiver to display the current relative Signal Quality of the decoded digital signal. Observe the following syntax.

**SA1QLTY**

**QLTY** polls the receiver for the current relative Signal Quality (decoded digital signal). The receiver responds by displaying the following.

**QLTY=#**

# can be any number from 0 (bad) through 9 (good). Signal Quality depends, in part, on the current Symbol Rate. For information about Signal Quality, see “Dish Pointing menu”.

## Signal State

The **STATE** command is available for polling the receiver for the current receiver operating/Signal State. Observe the following syntax.

**SA1STATE**

**STATE** polls the receiver for the current operating/Signal State. The receiver responds by displaying the following.

**STATE=#**

# can be (see Table 15 below). Returned status codes represent all possible operating states. Note that each command response (instance) reflects the instantaneous operating state of the receiver which may indicate a response which is erroneous or unexpected. If an unexpected response is received, the steady or normalized operating state of the receiver can best be determined if this command is execute repeatedly.

**Table 15. Possible signal status codes and descriptions**

State Code	Response
0	No lock
10	Search Mode Active
20	Loss of Signal Time-out
30	Channel Change In Progress
40	Digital Lock, No Signal
50	Digital Lock, and Signal
60	Unauthorized Program Active
70	Authorized Program Active

## Signal Strength (AGC level)

The **AGC** command is available for polling the receiver to display the current relative Signal Strength (or AGC level) of the decoded digital signal. Observe the following syntax.

**SA1AGC**

**AGC** polls the receiver for the current relative Signal Strength (decoded digital signal). The receiver responds by displaying the following.

**AGC=#**

# can be any number from 0 (bad) through 99 (good). Signal Strength is the associated with the AGC (Automatic Gain Control) signal level. For more information about the Signal Strength, see “Dish Pointing menu”.



# Version

The Version command is available for polling the receiver to display the version (model) identification number. Observe the following syntax.

## SAIVER

**VER** polls the receiver for the version (model) number. The receiver responds by displaying the following.

VER=D9234\_BSR

VER can only be the version (model) number of the receiver.



# Appendix D Customer information

This Appendix provides important information about your PowerVu Business Satellite Receiver. Refer to this section for:

- Product support and contact information

## Product support

Scientific-Atlanta provides customers with 24-hour hotline support from anywhere in North America. If you require technical assistance or product training support, or if you have any questions concerning your Scientific-Atlanta product, contact the appropriate Customer Support Center from those listed below. Satellite Television Networks (STN) customers who call a Customer Support Center are asked specific questions in order to identify their needs. In this way, each call can be directed to the customer support representative most experienced with your Scientific-Atlanta product. Customer Support Centers also provide the following pre- and post-sales support services for Scientific-Atlanta products.

If you call from...	Support Location	Contact information
USA or Canada	Atlanta, Georgia, USA Customer Support Center  Toronto, Ontario, Canada	Call toll free from anywhere in the USA or Canada: <b>1-800-722-2009, press 2 and then listen for prompts</b> or Call direct: <b>1-770-903-6900</b>  Call direct from anywhere in the world: <b>1-416-299-6888</b>
South America	Buenos Aires, Argentina	Call direct: <b>54-1-342-0321</b>
Europe, Middle East or Africa	London, England	Call toll free from anywhere in Europe: <b>1-800-220-145</b> or Call direct: <b>+441-923-271420</b>  For after hours support: <b>+441-426-841026</b>
Asia or Australia	Sydney, Australia	Call toll free from anywhere in Australia: <b>1-800-500-518</b>  or call direct: <b>+61-299-753678</b>

## Hotline technical support

24-hour hotline technical support services are available to answer technical questions about the operation, maintenance and repair of Scientific-Atlanta products.

## Training support

On and off-site training plus technical support services are available for both equipment operators and system administrators.

## Warranty and post-warranty support

Warranty and post-warranty support services are available to assist customers returning Scientific-Atlanta products for service or repair.

## Customer responsibility

When returning equipment, the customer is solely responsible for equipment packaging and transportation costs both to and from the factory.

At the customer's request, Scientific-Atlanta will make reasonable efforts to provide warranty service at the customer's premises, provided that the customer pays current field service rates plus direct travel and accommodation expenses.

## In case of a fault

If an equipment fault develops, perform following steps. For complete information, see "Product return".

1. Notify Scientific-Atlanta of the problem immediately, providing the model number and serial number of the equipment plus details of the problem. On receipt of this information, service information and shipping instructions will be provided.
2. (a) On receipt of instructions, return the product by prepaid freight.  
(b) If the product or fault is not covered under warranty, Scientific-Atlanta will provide an estimate of repair charges in advance of any work performed.



## Product return

To return any Scientific-Atlanta product for repair or replacement, follow the steps below. To be eligible for credit, a Material Return Authorization (RMA) number must accompany each product returned to Scientific-Atlanta. This number can only be obtained from your local Scientific-Atlanta Customer Support Center in advance of product return. Be sure to include this number in all correspondence.

1. Telephone or fax Scientific-Atlanta and request a Material Return Authorization for product return.
2. Tag or label the product with the following information.
  - Your name and full return address
  - Telephone contact number
  - RMA number
  - Sales order (if available)
  - Purchase order (if available).
  - Date the product was received
  - Brief description of problems
3. Repackage the product using the original carton and packing materials, if possible. If the original packaging is not available, repackage the product using a suitable corrugated carton (or similar shipping container). Be sure to wrap the product in sufficient protective packaging to prevent damage to the equipment during shipment.
4. Print or attach the following information on the outside of the carton or shipping container:
  - The full shipping address
  - Your name, your business name and full return address
  - Contact telephone number
  - RMA number
5. Ship the product prepaid and insured to the Scientific-Atlanta Customer Support Center (or other repair location) as directed. If you are unsure about where to ship the product, contact your local Scientific-Atlanta Customer Support Center, Scientific-Atlanta dealer or distributor. Scientific-Atlanta does not accept freight collect charges. Be sure to prepay all return shipments.

# Limited Warranty

Scientific-Atlanta Canada, Inc., hereafter called S-A, warrants that at time of shipment, goods sold shall be free from defects in material and workmanship, and shall be of the quality characterized and described by S-A. Notice of any defect shall be given in writing to S-A or an authorized representative immediately upon discovery of such defect within one [1] year of the date of shipment of the goods to the original purchaser only. S-A obligations under this warranty are limited to repair or replacement of the product [or accessories] that upon examination by S-A or an authorized representative are found to be defective. Under no circumstances shall the obligations of S-A under this warranty exceed the cost of goods sold. Approval for any goods returned for warranty must be obtained in advance from S-A or an authorized representative. S-A is not obligated to accept any goods returned for warranty without prior authorization. Any agreement made between an authorized S-A distributor and the original purchaser that extends product warranty beyond the one [1] year period warranted by S-A must not obligate S-A in any way. To obtain authorized warranty service, the purchaser must forward the goods by prepaid freight to S-A or an authorized service facility. S-A is not obligated to accept any costs related to the return of goods including freight, customs duties or brokerage fees incurred by the customer. This warranty is voided if a product is modified, altered or repaired by anyone other than S-A or an authorized service facility.

Repair charges deemed reasonable by S-A will apply to any goods returned for warranty and found to be in proper working condition. This warranty shall not apply to any damage caused by war or insurgence, act of God, improper maintenance or change of serial number, or by operation contrary to the information contained in the instruction manual. No liability is assumed by S-A for any collateral or consequential damages or losses associated with this product. S-A reserves the right the revise product specifications without prior notice.

## Warranty terms and conditions

All products manufactured by Scientific-Atlanta Canada Inc., hereinafter called S-A, are warranted to be free from defects in material and workmanship, and conform to currently published specifications. Scientific-Atlanta Canada extends warranty coverage to the original purchaser only. Products must be purchased from a recognized Scientific-Atlanta dealer or distributor.

## Limits of liability

Scientific-Atlanta's liability is limited to servicing, adjusting or correcting any product returned to the factory under warranty, including the replacement of defective components. Equipment repairs are billed at normal rates for any fault caused by improper installation, maintenance or use, or if the product is subject to abnormal operating conditions.

## Disclaimer

Scientific-Atlanta makes no representations that its PowerVu product line is fully compatible with similarly represented equipment from other vendors due to the wide range of implementation possibilities of the applicable standards.

Scientific-Atlanta disclaims all statutory and implied warranties such as warranties of merchantability and fitness for purpose. In no event shall Scientific-Atlanta be liable for incidental, indirect or consequential damages, regardless of being informed about the possibility of such damages, and in no event shall Scientific-Atlanta's liability exceed the purchase price of the product.

## FCC notices

This equipment has been tested and found to comply with the limits for a TV Interface device and Class B digital device according to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions supplied in this manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures.

- ☐ Reorient or relocate the television receiving antenna
- ☐ Increase the separation between the equipment and the receiver
- ☐ Connect the equipment to an AC outlet on a circuit different from that to which the receiver is connected
- ☐ Contact your dealer/reseller or an experienced radio/TV technician for help

The user may find the booklet "Interference handbook" prepared by the Federal Communications Commission helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock no. 004-000-00450-7.

Shielded cables should be used to interconnect this device with any other/peripheral equipment (e.g., TV monitors, terminals, data sources, etc.) to ensure compliance with Class B limits. Failure to do so may result in radio or TV interference. Cables should be of braided shield construction with metal end shells.

The manufacturer is not responsible for any radio or TV interference resulting from unauthorized modification of this equipment. It is the responsibility of the user to correct such interference at the user's expense.

## Industry Canada notice

This digital apparatus does not exceed the limits for Class B radio noise emissions from digital apparatus as set out in the radio interference regulations of Industry Canada.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de Class B prescrites dans le reglement sur le brouillage radioelectrique edicte par Industrie Canada.

## Manufacturer's Declaration of Conformity

The Product PowerVu Business Satellite Receiver  
(Type, Description)

Reference Number Model D9234  
(Model or Catalog designation)

Rating 100 - 240 VAC, 1.5 A, 50-60 Hz

has been designed and manufactured in accordance with the following  
Harmonized standards

- EN 60065: 1993 - Safety requirements for mains operated electronic  
and related apparatus for household and similar  
general use
- EN 55022: 1987 - Limits and methods of measurement of radio  
interference characteristics of information  
technology equipment, Class B
- EN 50082-1:1992 - Electromagnetic compatibility - Generic immunity  
standard, Part 1: Residential, commercial and  
light industry
- EN 61000-3-2:1995- Harmonic current emissions (in.current < 16A/phase)
- EN 61000-3-3:1995- Voltage fluctuations and flicker (rated current  
< 16A/phase)

(Number and Date of issue)

according to the provisions of the Low Voltage Directive 73/23/EEC  
and the Electromagnetic Compatibility Directive 89/336/EEC,  
amended per Directive 93/68/EEC

Toronto, Canada, January 1997  
(Issue place and date)

Scientific-Atlanta Canada Inc. (Satellite Television Network Div)  
(Company name)

120 Middlefield Road, Scarborough, Ontario, Canada M1S 4M6  
(Company address)

For the manufacturer: Gina Zivkovic, Qualifications Engineer  
(Signature, Name and Title)

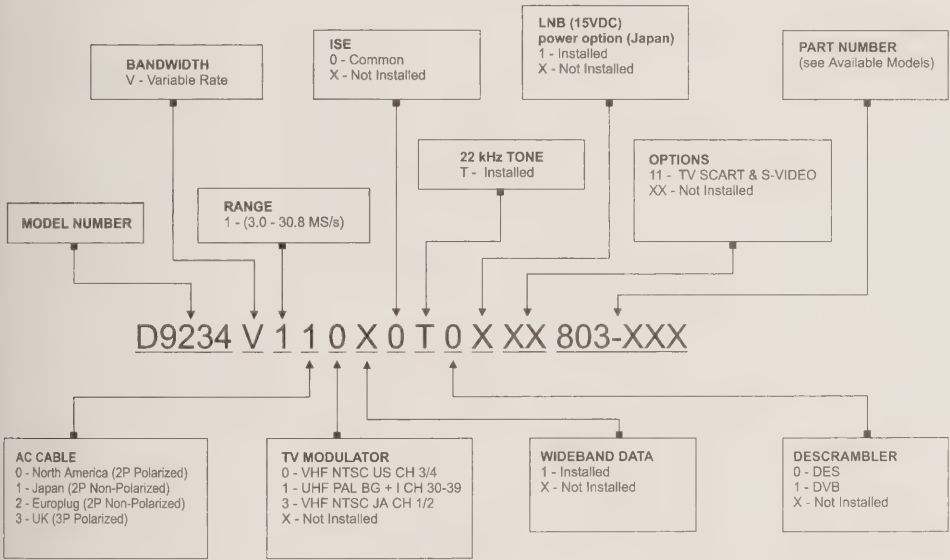


# Appendix E Product identification

This Appendix provides important information about your PowerVu Business Satellite Receiver. Refer to this section for:

Product identification information

The label affixed to the receiver rear panel contains a 16-digit product identification code number that identifies your receiver, including factory options. The accompanying figure shows the product identification code with available factory options. Use this information to help identify your receiver. Note that certain models are designed for use in various countries or jurisdictions. For more information about product ordering, contact your local Scientific-Atlanta Customer Support Center, Scientific-Atlanta dealer or distributor.



Available Models

803-302	North America (NTSC CH3/CH4 modulator and N. American power cord [with Wideband data])
803-303	Japan (NTSC CH1/CH2 modulator with 15 Volt LNB power supply and Japan. power cord [with Wideband data])
803-304	UK (PAL B/G + I, CH30-CH39 modulator with TV SCART and UK power cord [with Wideband data])
803-305	Euro-Asia (PAL B/G + I, CH30-CH39 modulator with TV SCART and Euro. power cord [with Wideband data])
803-306	Australian (PAL B/G + I, CH30-CH39 modulator with TV SCART and Aus. Power cord [with Wideband data])

Some product options are available only with certain models

Figure19. Example product identification code showing options













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**Scientific-Atlanta, Inc. Satellite Television Networks**

**United States:** 4356 Communications Drive, Norcross, GA 30093; Tel.: 1-770-903-6057; Fax: 1-770-903-6464

**Canada:** 120 Middlefield Road, Scarborough, Ontario M1S 4M6 Canada; Tel.: 1-416-299-6888; Fax: 1-416-299-7145

**United Kingdom:** Home Park Estate, Kings Langley, Herts WD4 8LZ United Kingdom; Tel.: 44-1923-271444; Fax: 44-1923-271428

**Australia:** Unit 2, 2 Aquatic Drive, French's Forest, NSW 2086, Australia; Tel.: 612-9-452-3388; Fax: 612-9-451-4432

**Italy:** Via Fosso Centroni 4, Angolo Via Anagnina, 00040 Roma, Italy; Tel.: 39-67-984-0030; Fax: 39-67-984-0034

**Chile:** Avda. 11 de Septiembre 2155, Torre C - Of. 807, Santiago, Chile; Tel.: 56-2-232-2681; Fax: 56-2-232-2002

**Argentina:** Scientific-Atlanta, Inc., 25 de Mayo 293, Piso 7A, 1002 Buenos Aires, Argentina; Tel.: 54-1 342-0321; Fax: 54-1 345-8047

**Singapore:** Scientific-Atlanta (S) Pte. Ltd., 1 Claymore Drive, #08-11 Orchard Towers, Singapore 229594; Tel.: 65-733-4314; Fax: 65-733-2706

**Beijing:** Lucky Tower, Block B, Suite 1413-14, No. 3 Dong San Huan Bei Lu, Beijing, China 100027; Tel.: 8610-461-5761; Fax: 8610-461-5754